National Library of Canada

Acquisitions and Bibliographic Services Branch

395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale du Canada

Direction des acquisitions et des services bibliographiques

395, rue Wellington
Ottawa (Ontario)
K1A 0N4

Your file Votre référence

Our file Notre référence

NOTICE

The quality of this microform is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Reproduction in full or in part of this microform is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30, and subsequent amendments.

AVIS

La qualité de cette microforme dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

La reproduction, même partielle, de cette microforme est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30, et ses amendements subséquents.

Canada

UNIVERSITY OF ALBERTA

A SURVEY OF THE DEVELOPMENT AND USE OF COMPUTER BASED INTERACTIVE MULTIMEDIA TRAINING AMONG SELECTED NORTHERN ALBERTA ORGANIZATIONS

by

PETER LONEY ©

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF MASTER OF EDUCATION

IN

INSTRUCTIONAL TECHNOLOGY

THE DEPARTMENT OF ADULT CAREER AND TECHNOLOGY EDUCATION

EDMONTON, ALBERTA

SPRING 1992

National Library
of Canada

Acquisitions and
Bibliographic Services Branch

395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale
du Canada

Direction des acquisitions et
des services bibliographiques

395, rue Wellington
Ottawa (Ontario)
K1A 0N4

Your file Votre référence

Our file Notre référence

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à la disposition des personnes intéressées.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission.

L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN 0-315-82105-1

Canada

UNIVERSITY OF ALBERTA

RELEASE FORM

NAME OF AUTHOR: Peter J. Loney

TITLE OF THESIS: A Survey of the Development and Use of Computer Based Interactive Multimedia Training Among Selected Northern Alberta Organizations

DEGREE: Master of Education

Permission is hereby granted to the University of Alberta Library to reproduce single copies of this thesis and to lend or sell such copies for private, scholarly or scientific research purposes only.

The author reserves all other publication and other rights in association with the copyright in the thesis, and except as herinbefore provided neither the thesis nor any substantial portion thereof may be printed or otherwise reproduced in any material form whatever without the author's prior written permission.

Peter Loney

Peter Loney

21 Keegano
Edmonton, AB
T6K 0R3

April 22, 1993

UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled A Survey of the Development and Use of Computer Based Interactive Multimedia Training Among Selected Northern Alberta Organizations submitted by Peter J. Loney in partial fulfilment of the requirements for the degree of Master of Education.

Michael Szabo

DR. M. SZABO

A K Deane

MR. A. DEANE

DR. C. MONTGOMERIE

April 8, 1993

I dedicated this work to my family.

To my wife Mary Catharine Macdonald
who has been patient and supportive,
To my children, MaryAnne and Meghan who have been a delight,
and to my parents and brother who have wished me the best
and been confident in my success,
Thank You.

ABSTRACT

Although there is a growing interest in the use of interactive multimedia for employee training, little research has been conducted on its use by Canadian employers. The purpose of this study was to find out the extent to which computer-based interactive multimedia training (CBIMT) is used to train employees of a select group of organizations in Edmonton, Alberta.

In February 1992, members of the Alberta Society for Human Resource and Organizational Development (ASHROD) were surveyed about their employers' development and use of CBIMT. ASHROD is a professional association of training, human resource and organizational development professionals. Fifty six ASHROD members were sent questionnaires. Forty four responded, for a response rate of 79%.

Twelve of the 44 organizations developed CBIMT and 45% used it. Among developers there was a 'U' shaped distribution with small organizations developing for sale, medium sized organizations not developing and large organizations developing for internal use.

Use varied as functions of both business activity and size. Organizations in the goods producing (manufacturing and resource), financial, real estate, insurance or banking, and transportation, utilities and communications sectors used CBIMT the most. Those in the retail and wholesale trade, government, and education services sectors used it

the least. Larger organizations were more likely to use CBIMT.

Most developers and users expected to maintain or increase development and/or use of CBIMT. This suggests a high degree of satisfaction.

Quest and Authorware were the most common authoring systems used and IBM and IBM compatible the most common platform. Computer, hard, and soft skills were taught using CBIMT with computer skills predominating.

Flexibility and individualization were considered to be the greatest advantages of CBIMT and cost and availability of courseware the greatest disadvantages.

Implications for further research are discussed.

ACKNOWLEDGEMENTS

Several people have helped during the preparation and completion of this thesis.

First, I wish to thank my advisor, Dr. Michael Szabo. He provided encouragement, good advice and patience throughout. Thanks also to my committee members, Art Deane and Dr. Craig Montgomerie. Their suggestions and kind words have been much appreciated.

I wish to acknowledge as well, those who contributed to the development of the questionnaire: Dr. Szabo, Fred McMahon, and Stephen Lamoureux.

Finally, I want to thank my collegues and the professors and staff in the faculty of Adult, Career and Technology Education. I've enjoyed my time in the program. It has been rewarding intellectually and I've made many friends.

TABLE OF CONTENTS

CHAPTER ONE: OVERVIEW OF THE PROBLEM 1

Introduction 1

Problem 4

Subproblems 4

Significance 5

Delimitations 6

Limitations 7

Assumptions 8

Definitions 9

CHAPTER TWO: LITERATURE REVIEW 12

Factors Related to the Use of CBIMT for Adult Training in Canada 12

Evaluation of CBIMT 14

Use of CBIMT in Canada 15

Surveys of Training in the United States 20

Conclusion 26

CHAPTER THREE: METHODOLOGY 28

Study Sample and Population 29

Development and Validation of the Questionnaire . 29

Organization of the Questionnaire 30

Administration of the Questionnaire 30

Data Analysis and Presentation 31

Subproblems - Development, Data Collection, Data Analysis and Presentation 32

CHAPTER FOUR: FINDINGS 39

Subproblem 1 39

Subproblem 2 60

Subproblem 3 81

Subproblem 4 82

Subproblem 5 84

Subproblem 6 88

Subproblem 7 90

CHAPTER FIVE: DISCUSSION OF RESULTS, CONCLUSIONS, AND IMPLICATIONS FOR FURTHER STUDY 92

Subproblem 1 92

Subproblem 2 104

Subproblem 3 110

Subproblem 4 111

Subproblem 5 113

Subproblem 6 119

Subproblem 7 120

Summary of Results 121

Comparison with Other Studies 123

Recommendations for Further Research 125

Suggestions for Improvements to the Questionnaire 126

Conclusion 129

REFERENCES 131

APPENDIX A: SURVEY INSTRUMENT 134

APPENDIX B: RESPONDENT ORGANIZATIONS 147

LIST OF TABLES

II-1 Use of Computer Assisted Education Systems Across Industry Divisions 18

II-2 Training Technologies or Delivery Methods 19

II-3 Computer Hardware Used by Training Departments 20

II-4 Percentage of U.S. Organizations Using CBT 22

II-5 Percentage of U.S. Organizations Using CBIVT . . . 23

II-6 Percentage of CBT Users by Skills Taught 24

II-7 Percentage of Organizations Using Each Type of Computer 24

IV-1 Development of CBIMT by Respondent Organizations 39

IV-2 Development of CBIMT as a Function of Business Activity 40

IV-3 Purpose of CBIMT Development As a Function of Business Activity 41

IV-4 CBIMT Development as a Function of Number of Employee 43

IV-5 Purpose of CBIMT Development as a Function of Number of Employees in North America 43

IV-6 CBIMT Development As a Function of Number of Branches 44

IV-7 Purpose of CBIMT Development as a Function of Number of Branches 45

IV-8 CBIMT Development As a Function of Training in Alberta 46
IV-9 Purpose of CBIMT Development as a Function of Amount Spent on Training in Alberta 46
IV-10 CBIMT Development As a Function of Number of Training Staff in Alberta 47
IV-11 Purpose of CBIMT Development As a Function of Number of Training Staff in Alberta 48
IV-12 CBIMT Development As a Function of the Average Number of Training Days per Employee 49
IV-13 Purpose of CBIMT Development As a Function of the Average Number of Training Days per Employee 49
IV-14 Use of CBIMT by Respondent Organizations 50
IV-15 CBIMT Use as a Function of Primary Business Activity 51
IV-16 CBIMT Use as a Function of Number of Employees in North America 52
IV-17 CBIMT Use as a Function of Number of Branches in North America 53
IV-18 CBIMT Use as a Function of Number of Branches in North America (Responses Grouped) 54
IV-19 CBIMT Use as a Function of Amount Spent on Training in Alberta 55
IV-20 CBIMT Use as a Function of Amount Spent on Training in Alberta (Responses Regrouped) . . . 55

IV-21 CBIMT Use as a Function of the Number of Full Time Equivalent Training Staff in Alberta . . . 56
IV-22 CBIMT Use as a Function of Number of Training Days Per Employee in Alberta 57
IV-23 Percentage of Total Training Delivered by CBT 58
IV-24 Percentage of Individual Training Delivered by CBT 58
IV-25 Percentage of Group Training Delivered by CBT . . 58
IV-26 Percentage Total Training Delivered by CBIVT . . . 59
IV-27 Percentage Individual Training Delivered by CBIVT 59
IV-28 Expected Future CBIMT Development 60
IV-29 Expected Future CBIMT Development as a Function of Primary Business Activity 61
IV-30 Expected Future CBIMT Development as a Function of Number of Employees in North America 62
IV-31 Expected Future CBIMT Development as a Function of Number of Branches in North America 62
IV-32 Expected Future CBIMT Development as a Function of the Amount Spent on Training in Alberta 63
IV-33 Expected Future CBIMT Development as a Function of the Number of Training Staff in Alberta 63

IV-34 Expected Future CBIMT Development as a Function of Average Number of Days Training in Alberta 64
IV-35 Expected Use of CBT in Coming Year 64
IV-36 Expected Use of CBT in Coming Year as a Function of the Number of Employees in North America 65
IV-37 Expected Use of CBT in the Coming Year as a Function of Business Activity 66
IV-38 Expected Use of CBT in Coming Year as a Function of the Number of Branches in North America 66
IV-39 Expected Use of CBT in Coming Year as a Function of Amount Spent on Training in Alberta 67
IV-40 Expected Use of CBT in Coming Year as a Function of the Number of Training Staff in Alberta 68
IV-41 Expected Use of CBT in Coming Year as a Function of Average Number of Days Training per Employee in Alberta 68
IV-42 Expected Use of CBIVT in the Coming Year 69
IV-43 Expected Use of CBIVT in the Coming Year as a Function of Business Activity 70
IV-44 Expected Use of CBIVT in the Coming Year as a Function of Number of Employees in North America 70

IV-45 Expected Use of CBIVT in the Coming Year as a Function of Number of Branches in North America 71
IV-46 Expected Use of CBIVT in the Coming Year as a Function of Amount Spent on Training in Alberta 71
IV-47 Expected Use of CBIVT in the Coming Year as a Function of Number of Training Staff in Alberta 72
IV-48 Expected Use of CBIVT in the Coming Year as a Function of Average Days Training in Alberta 72
IV-49 Non-users Plans to Implement CBIMT 73
IV-50 Non-users Plans to Investigate CBIMT 73
IV-51 Plans to Implement CBIMT as a Function of Business Activity 74
IV-52 Plans to Investigate CBIMT as a Function of Business Activity 75
IV-53 Plans to Implement CBIMT as a Function of Number of Employees in North America 76
IV-54 Plans to Investigate CBIMT as a Function of Number of Employees in North America 77
IV-55 Plans to Implement CBIMT as a Function of the Number of Branches in North America 77
IV-56 Plans to Investigate CBIMT as a Function of Number of Branches in North America 78

IV-57 Plans to Implement CBIMT as a Function of the Amount Spent on Training in Alberta 78
IV-58 Plans to Investigate CBIMT as a Function of the Amount Spent on Training in Alberta 79
IV-59 Plans to Implement CBIMT as a Function of the Number of Training Staff in Alberta 79
IV-60 Plans to Investigate CBIMT as a Function of the Number of Training Staff in Alberta 80
IV-61 Plans to Implement CBIMT as a Function of Average Days Training per Employee in Alberta 80
IV-62 Plans to Investigate CBIMT as a Function of Average Days Training per Employee in Alberta 81
IV-63 Authoring Software Used by Survey Respondents . . 81
IV-64 Type of Computer Used to Deliver CBT 82
IV-65 Type of Microcomputer Used to Deliver CBT 82
IV-66 Type of Computer Used to Deliver CBIVT 83
IV-67 Type of Microcomputer Used to Deliver CBIVT . . . 83
IV-68 Job Categories Trained Using CBT 84
IV-69 Job Categories Trained Using CBIVT 85
IV-70 Skills Trained Using CBT 86
IV-71 Skills Trained Using CBIVT 87
IV-72 Perceived Advantages of CBT 88
IV-73 Perceived Advantages of CBIVT 89
IV-74 Perceived Disadvantages of CBT 90
IV-75 Perceived Disadvantages of CBIVT 91

V-1 Percentage of Organizations Using CBT in 1992 by Number of Employees 99

V-2 Percentage of Organizations Using CBT in 1992 by Number of Employees 101

V-3 Percentage of Organizations Using CBIVT by Number of Employees 102

V-4 Skills Trained Using CBIMT 117

CHAPTER ONE

OVERVIEW OF THE PROBLEM

Introduction

There is a growing recognition of the value of employee training to Canadian economic success. Due to the drop in birthrate that followed the baby boom, the number of new entrants to the labour force is projected to decline by more than twenty five per cent during the 1990s. This, along with the ever increasing pace of technological change is predicted to cause skilled labour shortages. Employee training can increase labour productivity and help adapt workers to the changing workplace (Morrison & Rubenson, 1989).

One method of delivering training is to use computers. Computer-based training (CBT) is the use of computers to deliver training. It includes computer aided instruction (CAI) by which the computer teaches the lesson and computer managed instruction (CMI) whereby the computer directs training through diagnostic and prescriptive assessment. The addition of video to training through use of computer controlled video, is referred to as computer-based interactive video training (CBIVT). Both CBT and CBIVT are types of computer-based interactive multimedia training (CBIMT) (Filipczak, 1991). We define CBIMT as the use of multimedia training environments to encourage learning

through active processing of information (as opposed to the passive reception of information). In the case of CBT, the media are text, graphics, and sometimes sound. In the case of CBIVT the video medium is added.

To deliver CBIMT, both hardware and software are needed. Hardware is the physical computer equipment while software refers to the sets of instructions or programs that tell the computer what to do. Courseware is the special type of software used for CBIMT. It includes lessons, simulations, exercises, tests and other instructional processes.

CBIMT has several advantages in the training environment. Studies have shown that CBT reduces learning time (Kulik, Kulik and Cohen, 1980). CBIMT can meet learning preferences identified by adult learning theorists (e.g. Knowles, 1980) such as the desire to control the sequence and pace of lessons. CBIMT can be convenient and cost effective because it can occur at the job site at any time and because few or no instructors are needed (Epstein, 1973 ; Head, 1985). On the other hand, CBIMT can be expensive to acquire or to construct and the return on investment is difficult to determine.

There are many references to the use of CBIMT by specific Canadian employers and to companies developing and selling courseware (e.g. in Duchastel, 1989). A 1989 Government of Canada study of the diffusion of technology in

the service industries showed that 22% of service industry employers used CBIMT with an additional 11% planning to use it during the subsequent three years (Communications Canada, 1990 & Industry, Science and Technology Canada). In a 1990 study of employee training and development, the authors identified several CBIMT technologies but did not give a figure for total use (Larson, & Blue, 1990). Further information about the status of CBIMT in Canada is scarce.

Studies conducted in the United States are quite informative about the status of CBIMT in that country. Training, a magazine for training professionals, has conducted a survey of employer-sponsored training annually since 1983. Findings show a gradual but continual increase in the use of CBIMT for corporate training throughout the 1980s and early 1990s. Surveys conducted by the Training and Development Journal and Computer Knowledge International, confirm this trend (Training & Development Journal, 1988; Hirschbuhl, 1988).

High development costs and poor quality software, especially lack of interactivity, have been cited as factors slowing the acceptance of CBT (Hirschbuhl, 1989; Parrott, 1985). Reduced hardware costs, improved authoring systems and educationally trained courseware programmers may be overcoming these problems. Declining production costs is making CBIVT more feasible. The improvement in visual quality caused by the addition of video is contributing to

the acceptance of CBIMT (Serveau, 1988).

Problem

What is the status of Computer-based Interactive Multimedia Training (CBIMT) of employees among organizations represented among the membership of the Edmonton chapter of the Alberta Society for Human Resource and Organizational Development (ASHROD)?

Subproblems

1. To what extent are survey respondents developing and/or using CBIMT?
   a) as a function of the business activity
   b) as a function of the total number of employees
   c) as a function of the number of physical locations
   d) as a function of the annual expenditure for training
   e) as a function of the number full time equivalent training staff employed by the organization
   f) as a function of the average number of days spent in training per employee in Alberta
2. Do survey respondents plan to increase, maintain or decrease their development and/or use of CBIMT during the coming year?
   a) as a function of the business activity
   b) as a function of the total number of employees
   c) as a function of the number of physical locations

d) as a function of the annual expenditure for training

e) as a function of the number full time equivalent training staff employed by the organization

f) as a function of the average number of days spent in training per employee in Alberta

3. What authoring software is used by survey respondents?
4. What computer hardware do survey respondents use to deliver CBIMT?
5. For what job categories and types of skills is CBIMT used?
6. What do survey respondents perceive to be the advantages of CBIMT?
7. What do survey respondents perceive to be impediments to the adoption or increased use of CBIMT in their organizations?

Significance

The value of employee training is increasingly being recognized. To support and improve employee training and to encourage its growth, it is beneficial to know what training is taking place and by what methods it is being conducted. This study will contribute to this knowledge by determining the status of CBIMT in organizations represented among the membership of the Edmonton chapter of ASHROD

According to studies conducted in the United States the use of CBIMT in that country is growing. Except for the

Technologies in Services and Training and development 1990: Expenditures and policies studies, there is a lack of similar data for Canada (Communications Canada, 1990 & Industry, Science and Technology Canada and Larson & Blue, 1990). This study is an attempt to contribute further knowledge of the status of CBIMT in Canada.

Delimitations

The purpose of this study was to determine the status of in-house, employer sponsored training of employees using CBIMT. Organizations represented among the membership of the Edmonton chapter of the Alberta Society for Human Resource and Organizational Development (ASHROD) were surveyed. Among these organizations are Edmonton and Northern Alberta private, public and not-for-profit sector employers, and small organizations which develop and/or deliver training.

CBIMT includes teaching and managing instruction by computer. It does not include book based tutorials which teach computer software. Such lessons use computers for student exercises but the actual teaching and management of instruction reside in the books rather than on computers.

Limitations

It is difficult to precisely measure the importance of CBIMT in an organization's training. To attempt to determine this, the percentage of total training done by CBIMT was assessed.

For many, CBT and CBIVT are unfamiliar technologies. While both were defined in the survey questionnaire, some respondents may have misunderstood these terms.

Respondents were asked about their expectations of future CBIMT use in their organizations. While this is a common question in CBIMT surveys in the United States, a high correlation between expectations and subsequent events has not been found. The predictive value of this item may be limited and may reveal more about attitudes and organizational change than about what will actually happen a year later.

Another limitation results from the decentralized nature of training in many large organizations. In his study of CBT in U.S. corporations, Hirschbuhl found that in many companies, no individual knew about all of the CBT that was taking place (1989). In an attempt to overcome this problem, training directors were asked about other sections of the company that engage in training and if necessary, more than one person in an organization were asked to fill out a questionnaire.

Several members of ASHROD work for departments of the

Government of Alberta or the City of Edmonton. On the assumption that training decisions are made at the department level in these governments, these departments were treated as separate organizations. Two other large organizations, Nova and the University of Alberta, were treated the same way. There may be characteristics of departments of large organizations that would make them more or less likely than discrete organizations to develop or use CBIMT.

As ASHROD is a volunteer organization of human resource and organizational development professionals, the organizations members represent may be more committed to training and human resource development than are organizations not represented among the membership of ASHROD. This may bias the results in the direction of indicating greater use of CBIMT for Training than occurs among organizations not represented by ASHROD members. This could diminish the generalizability of the results.

Assumptions

It is assumed that the survey questionnaire is a valid instrument and that the response rate to the questionnaire was adequate for a valid study. It is further assumed that the respondents answered the questions honestly and that they knew enough about their organization's use of CBIMT to provide accurate information.

Definitions

Computer-based Interactive Multimedia Training (CBIMT)

CBIMT is the use of CBT and/or CBIVT training environments to encourage learning through active processing of information (as opposed to the passive reception of information). A variety of other media can be used, including text and graphics (Filipczak, 1991). As the term CBIMT is relatively new, it was not used in the questionnaire. The component terms, CBT and CBIVT were used instead as they were judged to have more widespread meaning among survey respondents.

Computer-based Training (CBT)

CBT is the use of computers to deliver training. It includes Computer Aided Instruction (CAI) and Computer Managed Instruction (CMI). With CAI, the computer teaches the lesson, usually by using a tutorial, review and practice, or simulation mode of instruction. CMI provides direction or management of training by computer. The computer tests the learner over specific training objectives and displays met and unmet objectives. The computer then informs the learner what lessons need to be completed to meet the unmet objectives. CMI thus has a diagnostic and prescriptive component but does not do the teaching. When CAI and CMI are used together, the computer both teaches and directs the student.

Excluded from the definition of CBT is use of the

computer as a pure tool such as for word processing, database management or process control.

Computer-based Interactive Video Training (CBIVT)

CBIVT is the addition of video to Computer-based Training. The most common technology used for the video portion is analog videodisc but there is growing interest in and some use of digital video technologies such as CD-ROM.

Hardware

Hardware is the physical computer equipment. A typical computer includes such hardware as a central processing unit, memory, and input/output devices.

Software

Software refers to the sets of instructions or programs that tell the computer what to do.

Courseware

Courseware is the special type of software used for CBIMT. It includes lessons, simulations, exercises, tests and other instructional materials.

Individual Training

An individual being trained by him or herself, is participating in individual training. CBIMT is used for individual training when the individual engages in a lesson on a computer independent of other learners.

Group Training

Group training occurs when more than one person is being trained in the same content at the same time. It

usually involves interaction among the learners as well as between learners and instructor. CBIMT may be used for group training in a hybrid teaching environment where a human instructor teaches some of the time and the computers teaches some of the time. It also may be used in a cooperative learning situation, where two or more learners work on the computer together.

CHAPTER TWO

LITERATURE REVIEW

A literature review was conducted to determine the status of CBIMT in North America. The period covered in the review was 1983 to 1992. To find Canadian data, database searches were done on ABI/Inform, Pais International, Management Contents, Microcomputer Index, Canadian Business and Current Affairs, and ERIC. Manual searches of government documents and education periodicals were also conducted. These searches revealed several references to CBIMT use by individual organizations and two survey reports: Technologies in Services (Communications Canada & Industry, Science and Technology Canada, 1990) and Training and Development 1990: Expenditures and Policies (Larson & Blue, 1990).

In the United States several surveys have measured CBT use in that country. These are summarized later in this chapter. The importance of employee training to Canada, the role that CBIMT can play in meeting Canada's training needs and the effectiveness and cost advantages of CBIMT are also discussed.

Factors Related to the Use of CBIMT for Adult Training in Canada

Training has been recognized by many government, business and labour leaders to be a key element of Canada's

ability to adjust to the following developments:

- the aging of its workforce
- rapid technological change
- the shift in employment from primary and manufacturing jobs to service jobs
- increased international competition

(Employment and Immigration Canada, 1989).

Despite this, Canadian employers train their employees much less than do employers in other industrialized countries. "The average Canadian worker now receives annually only seven hours of training, against 17 in Australia, 170 hours in Sweden and 200 hours in Japan" (Wynne-Edwards, 1991, p.7). Employers spend less than half as much per worker on training as do U.S. employers (Premier's Council, 1990). Government has frequently been urged to promote training and employers admonished for not doing enough of it. Indeed, "...forty reports over the last 10 years have produced 600 recommendations about education and training in Canada." (Wynne-Edwards, 1991, p.7)

Greater use of CBIMT may be an economical and effective way to increase the amount of employee training done. In its report, Learning to Win, the Human Resource Development Committee of the National Advisory Board on Science and Technology recommended "...investments in computer assisted learning as a means of increasing the productivity of both formal education and adult training by large factors."

(Wynne-Edwards, 1991, p.6)

Evaluation of CBIMT

CBIMT has been found to effectively increase or maintain achievement, reduce time spent in learning and improve attitude toward instruction and content. Kulik, Kulik and Cohen, in a meta-analysis of findings of studies of college teaching, found that learning time is reduced by twenty to fifty per cent when CAI is used (1980).

Adult learning theory includes a number of conditions of learning that CBIMT is well suited to meet. Adults have been found to learn better if they are motivated, confident and comfortable with their learning environment. Many adults prefer to be self directing and to control the pace and direction of their learning. They are concerned about time and want training to be practical to their lives. They bring to the learning environment a rich background and an established view of themselves and the world. Failure can threaten that self concept and so many prefer a mastery approach to learning. Adults have been found to learn equally well individually and in groups (Knowles, 1980).

CBIMT lessons can be designed to be self directed. The learner can control the sequence, pace and sometimes even the content of the lesson. CBIMT is done alone rather than in a group so the learner is relieved of the anxiety of performing in front of others. A mastery approach can be

built into CBIMT, increasing the chances of success.

Training delivery cost is important to organizations providing training. Training costs include student and instructor costs such as per diem, travel, lost opportunities, instructional development costs, facilities costs and maintenance costs. Costs of facilities, instructors, student travel and lost opportunities can be diminished or eliminated with the use of CBIMT. This is because CBIMT can occur at the job site at times convenient to both employer and employee (Epstein, 1973 ; Head, 1985).

Instructional development costs, however, are much greater for CBIMT than for instructor-led courses. To be cost effective, CBIMT courses must train enough students for the savings in delivery to offset the development costs.

Use of CBIMT in Canada

Published reports suggest widespread use of CBIMT, especially by large employers. "Most of the large financial institutions in Canada now use, to a lesser or greater extent, CBT" (Duchastel, 1989, p. 27). Following are examples of CBIMT use by individual Canadian organizations referred to in periodical articles:

- In 1984, Great-West Life Assurance Company was using a CBT program authored using the Phoenix System to train adjusters ("Firm's Computer-based Training, 1984).

- In 1987, Revenue Canada was using CBT to train full and part time employees and had developed a prototype for CBIVT (Kennedy, 1987).
- In 1987, Esso Canada was using PLATO, Control Data Corporation's CBT system to instruct workers in oil spill procedures (Chevreau, 1987).
- In 1987, General Motors of Canada was using PLATO to train electricians and assembly line workers (Chevreau, 1987 and Roth, 1985),
- Apple Canada developed a computer-based keyboarding program for its employees (Prychidny, 1988).
- In 1988 Crown Life Insurance Company was using CBIVT for almost all of its personal computer training (Buckler & Greiner, 1988).
- In 1988 Ontario Hydro was using CBT as well as other teaching methods to teach computer skills (Buckler & Greiner, 1988).
- Royal Trust, the Royal Bank, the Toronto-Dominion Bank, Bank of Nova Scotia and Manulife use the Phoenix authoring system because it is both IBM micro and mainframe compatible (Duchastel, 1989, p. 27).
- Northern Telecom uses CBT developed with the Authorware authoring system to train customers on a large computerized telephone switch (Computing

Canada, 1991, p.34).

- The Regional-Municipality of Ottawa-Carleton uses CBT to teach computer applications such as MsDos, WordPerfect and dBase (Buszowski, 1991, p. 40).
- The Edmonton City Police Training Department began converting to CBT in 1983 and have noted increases in both paper and pencil test and on the job performance measures. Significant cost savings have resulted (Szabo, 1987).

Since the mid 1980s, the Economic Council of Canada and Statistics Canada have examined the use of technology by several sectors of the Canadian economy. The majority of these studies focused on technologies used in production and administration, and did not include technologies used for training (e.g. Statistics Canada, 1987). One, however, a March 1989 survey of current and projected use of computer-based technologies and applications within Canadian service industries, did include use of CBIMT. In that study it was labelled Computer Assisted Education (CAE). The major findings of the study were related in a 1990 report prepared by Communications Canada and Industry, Science and Technology Canada entitled, Technologies in Services.

The study showed that 17% of employers with fewer than 200 employees used Computer Assisted Education while 28% of those with more than 200 employees used it (Communications Canada & Industry, Science and Technology Canada, 1990).

Table II-1, derived from the same study, shows use and planned use of CAE by industry. Industries using CAE the most were communications and finance and insurance while those using it the least were retail trade and accommodation and food.

Table II-1

Use of Computer Assisted Education Systems Across Industry Divisions

Industry Group	Currently Using CAE	Planning to Use CAE within the Next 3 Years
Transportation	26	11
Communication	32	22
Wholesale Trade	22	10
Retail Trade	14	7
Finance & Insurance	37	19
Real Estate	20	16
Business Services	28	13
Accom. & Food	13	9
All industries	22	11

(Communications Canada & Industry, Science and Technology Canada, 1990)

In 1990, in keeping with the growing interest in training by Canadian policy makers, commissions and advisory committees, the Conference Board of Canada established a group called the Canadian Training Directors' Forum, made up

of directors of training and development of leading Canadian companies. This group suggested an annual survey of training in Canada to get base-line data about training practices and policies in Canadian companies. A survey of medium and large companies was conducted that year. It included questions about the use of technology in training, (Larson & Blue, 1990).

It was found that 11% of respondents used computer software for course delivery and 21% planned to use it in the next two years. Eight percent used authoring systems and 14% expected to use them within two years. Table II-2 below consists of data from the Conference Board Survey showing the extent of use of various CBIMT training technologies and delivery methods.

Table II-2

Training Technologies or Delivery Methods

Type	Now in Use (%)	In Two Yrs.(%)
CD-ROM	13	22
Computer aided instructional systems design	10	24
Authoring systems	8	14
Compact disk-interactive	7.5	15
Video disk	6	14
Digital video interactive	0	9
Hyper Text	0	4

(Larson & Blue, 1990)

The Conference Board of Canada report included data about the types of computers used by the training departments of respondents (Larson & Blue, 1990). That data is summarized in Table II-3 below.

Table II-3

Computer Hardware Used by Training Departments

Computer Hardware	Percentage of respondents
Mainframe/mini computer	14
Mix mainframe/PCs	36
Networked PCs	6
Stand Alone PCs	26
Not Computerized	17

Sixty eight percent of the organizations represented in the Conference Board of Canada survey or 83% of those that used computers, used PCs. This data is not specific to the delivery of CBIMT but to all uses in training departments.

Surveys of Training in the United States

There is substantial available information about the status of CBIMT in the United States. Training, a journal oriented to the training profession, has conducted a survey of employer sponsored training annually since 1983. Questions about CBIMT have been included in these surveys (Geber, 1989, 1991; Gordon, 1985, 1986, 1988; Lee, 1987). The Training and Development Journal conducted a survey of

training activity in the United States in October 1986 and January 1988 and reported on another survey in the July 1986 issue (Fortune 800 Survey, 1988). In 1987, Computer Knowledge International conducted a literature search and telephone survey "to pinpoint the level of usage, development commitment, and user satisfaction with CBT as a training delivery system." (Hirschbuhl, 1987, p. 55)

Summary of Training Magazine Survey CBIMT Findings

Training magazine's annual surveys provide multi-year data, enabling year to year comparisons and the identification of trends. The CBIMT related findings of these surveys are summarized tables II-3 to II-6.

Table II-4 shows that use of CBT more than doubled between 1983 and 1989. The largest companies, those with over 10,000 employees, used it the most. Between 1986 and 1992 their use was relatively stable ranging between 60-70% of companies.

Most of the increase in overall use during this period was the result of steady growth in the number of medium and smaller sized companies using CBT. The continually decreasing cost of computer hardware and software and the growing use of computers by firms of this size range may have been important factors in this increase. As there are many more small companies than large ones, changes the number of smaller companies using CBT has a greater effect on overall use statistics than does changes in the number of

the largest companies using it.

Table II-4

Percentage of U.S. Organizations Using CBT

Year	Organizations (by Number of Employees)					
	100 -499	500 -999	1,000 -2,499	2,500 -9,999	10,000 or more	All Sizes
1983						19.1
1984						22.3
1985	26.5	30.7	35.4	40.7	55.6	28.2
1986	30.0	33.9	42.1	50.0	66.7	32.1
1987	32.1	39.5	39.8	50.5	65.9	34.3
1988	37.9	31.0	45.1	56.5	58.3	38.6
1989	43.3	43.6	48.0	52.1	64.0	44.1
1990	38.0	46.0	47.0	59.0	64.0	41.0
1991	39.0	49.0	39.0	58.0	61.0	43.0
1992	41.0	53.0	41.0	53.0	72.0	43.0

CBIVT is more expensive than CBT and its use grew more slowly. Table II-5 shows a small increase in the use of CBIVT between 1983 and 1992. During that period, it was used most by large companies. Their use remained stable throughout the period while some growth occurred among smaller companies.

Table II-5

Percentage of U.S. Organizations Using CBIVT

Year	Organizations (by Number of Employees)	
	10,000 or more	All Sizes
1983		4.6
1984		
1985		11.6
1986	36.3	15.5
1987	31.9	14.7
1988		
1989	34.0	11.4
1990	30.0	15.0
1991		16.0
1992		14.0

Training magazine's "... survey defines interactive video as the use of a computer, in conjunction with videotape or videodisc, as a delivery system of training" (Geber, 1989). Between 1986 and 1990, the proportion of CBIVT users employing video disk increased from 18.3% to 41%. Use of video tape stayed stable at between 70% - 80% of CBIVT users.

Table II-6 shows what companies employing CBT used it for. Acceptance of CBT was greatest for the teaching of computer related skills.

Table II-6

Percentage of CBT Users by Skills Taught

Year	Type of Skill		
	Computer Related Skills	Nontechnical Skills (Sales, Interpersonal)	Technical Skills (non Computer related
1985	49.6		
1986	91.7	23.4	29.8
1987	75.0	46.0	52.0
1988	90.0	28.0	30.0
1989	80.0	38.0	37.0
1990	84.0	17.0	26.0
1991	89.0	16.0	16.0
1992	87.0	23.0	18.0

Table II-7 shows the types of computers used in training. The data refer to use for purposes such as courses development and administration as well as for CBIMT.

Table II-7

Percentage of Organizations Using Each Type of Computer

Year	Type of Computer		
	Microcomputer	Minicomputer	Mainframe
1986	82.4	33.1	45.0
1987	87.0	50.0	44.0
1988	N/A	N/A	N/A
1989	84.8	25.0	45.3
1990	95.0	30.0	57.0
1991	93.0	31.0	51.0

The largest growth in the use of computers in training occurred in the use of microcomputers. Minicomputer use showed substantial variation but no consistent pattern of growth. There was some growth in the use of mainframes but less than in the use of microcomputers.

Other U.S. Surveys Relating to CBIMT

The Training and Development Journal conducted surveys of training activity in the U.S. in October 1986 and January 1988. The 1986 results showed that 44% of respondents used CBT and 36% used CBIVT. The percentage of respondents using CBIMT frequently or almost always was much lower: Only 4% for CBT and 7% for CBIVT. In 1988, both CBT and CBIVT were used frequently or almost always by 17% of respondents (Ralphs & Stephan, 1986 and Fortune 500 Survey, 1988).

Perhaps the most comprehensive survey of CBIMT use in the United States was conducted in 1987 by Computer Knowledge International. This study comprised of a literature search and a telephone survey of large Fortune 500 companies.

Hirschbuhl identified airlines and the data processing industry as having the highest level of CBT use. Banks had the next level of use followed by the insurance and manufacturing industry. The telephone and health industries were next while the accounting business was last among the sectors surveyed, having a low level of use. Among all of these industries, use was growing.

Other findings were as follows:

- Between 1985 and 1987 there was considerable growth in the use of CBIMT.
- The number of corporations supporting 100 learning stations or more grew 370% between 1985 and 1987
- Large corporations did not have central control over CBIMT use so often no one knew how much CBIMT was taking place.
- The main factors hampering CBIMT were poor quality courseware and lack of experienced CBIMT professionals.
- In 1987, 6% of courseware was developed in-house, 24% custom developed and 70% was vendor-supplied generic software.
- Corporations with 100 - 15,000 employees had two to five people involved in courseware development. Companies employing 15,000 to 30,000 people had two to ten courseware developers and companies with greater than 30,000 employees had 10 - 25 (Hirschbuhl, 1989).

Conclusion

Since the early 1980s there has been a slow, steady but often inconsistent growth in the use of CBIMT in the United States. Growth in the use of CBT has been substantial. Growth in the development and use of CBIVT, however, has

been slower. This may be due to its higher cost and changes in the technologies used. Use of CBIMT is greatest in large organizations but use in smaller organizations has been catching up during recent years. The most common use of CBIMT is to teach computer related skills.

While there is little information about the level of CBIMT use in Canada, the data that is available suggests that the level and pattern of use in Canada is similar to that in the United States.

CBIMT development is expensive and requires skilled personnel. Lack of such skilled people, the existence of poor quality courseware and the high cost of both hardware and courseware may be hampering the growth of CBIMT use. Training for courseware developers, more "friendly" authoring systems and the decline in hardware costs may result in increased growth in the acceptance of CBIMT.

CHAPTER THREE

METHODOLOGY

The problem that this research study proposes to answer is stated as follows:

What is the status of Computer-based Interactive Multimedia Training of employees among organizations represented by the membership of the Edmonton chapter of the Alberta Society for Human Resource and Organizational Development (ASHROD)?

The scope of the study is limited to organizations with ASHROD members. The problem has been chosen for several reasons.

1. An investigation of available literature has shown that information about the status of CBIMT in Canada and particularly in Alberta and Edmonton is lacking.
2. Studies of data from the United States showed CBT to be an important and growing training method (Hirschbuhl, 1989; Geber, 1989).
3. Because of the growing opinion that an increase in the use of CBIMT is needed to help satisfy Canada's training needs (Wayne-Edwards, 1991).

The subproblems reflect the questions and findings of both Canadian and U.S. surveys. They also reflect issues and trends in the status of Computer-based Interactive

Multimedia Training revealed by the above mentioned surveys and by other literature on the subject.

Study Sample and Population

The population of the study consists of 56 organizations represented by members of ASHROD. These organizations include corporate, government, and not for profit employers, and organizations which develop and/or deliver training. Because ASHROD is the primary professional organization for trainers in Edmonton, organizations represented by its membership are likely to be actively involved in training and/or developing training materials.

Development and Validation of the Questionnaire

Data was collected by means of a survey consisting of a single questionnaire. A survey is an appropriate method because a status study observes "phenomena of the moment...." (Leedy, 1989) and a survey is an observation tool. Available Canadian and U.S. data have been collected using survey methods.

The questionnaire was developed over the two year period of 1989 to 1991. Suggestions for questions were contributed by Dr. Szabo, the thesis supervisor and Fred McMahon and Stephen Lamoureux, two graduate students in the department of Adult, Career and Technology Education. The

questionnaire was reviewed and validated by three individuals who have been or are involved with the use/development of Interactive Multimedia in the corporate environment: Mr. Geoff Burston of Corporate Training, Ontario Hydro, Mr Ron Schlegelmilch, Business Consultant, formerly Product Manager for Apple Canada, Ltd. and Ms. Stephanie Dolsky, Computer Trainer, Alberta Social Services and graduate student in the department of Adult, Career and Technology Education. A copy of the questionnaire is included as Appendix A.

Organization of the Questionnaire

The questions in section one were used to collect demographic data. Section two was used to identify the organizations' development and usage of CBIMT. Section three contained questions about the organizations' development of CBIMT, section four the use of CBT and section five the use of CBIVT. All respondents were asked to complete sections one and two. Based on their answers to the questions in section two, they were directed to complete only those sections among the last three that were relevant to their organization.

Administration of the Questionnaire

In November 1991, a presentation explaining the study was made to the ASHROD executive in order to gain their

support. This was followed by an announcement in Persona, the ASHROD newsletter early in the new year. In February and early March 1992, ASHROD members in the selected organizations were contacted by telephone and advised that they would be receiving the survey. The surveys were then mailed out. Self addressed envelopes were included for their return. Most had been returned by the end of March 1992. Fifty six questionnaires were distributed and 44 returned for a return rate of 78.6%.

Questionnaires were coded numerically to maintain confidentiality and to assist in follow-up to ensure high completion rates. Respondents were given the phone number of the researcher should questions about interpretation arise. All calls were logged.

The anonymity of respondents and their organizations was maintained and communicated to all respondents. All matters pertaining to protection of human subjects' rights were properly considered.

Data Analysis and Presentation

Data were numerically coded and entered into the computer and verified using the SPSS data entry program. Cases were identified by survey number. To maintain confidentiality organization names were not included in the records. Once entered into the computer, the data were analyzed using SPSS/PC+ 4.0.

The primary method of analysis was to determine the frequencies of the responses to the questions. Where more than one answer to a question was possible, the multiple dichotomy function of the SPSS/Plus+ Table module was used to assemble all of the responses to the question into one table. In some of the tables created this way, the count and percentages of respondents that chose each answer is shown. As most respondents chose more than one answer, the percentages add up to greater than 100%.

The SPSS/Plus+ Table module was also used to create stub and banner tables which show the number of responses across categories as functions of the characteristics of the organizations. Results are discussed relative to the Canadian scene and are compared with data yielded by other North American studies (e.g. Hirschbuhl, 1989). Data are presented in table and paragraph form.

Subproblems - Development, Data Collection, Data Analysis and Presentation

Subproblem 1

To what extent are respondent organizations developing and/or using Computer-based Interactive Multimedia Training?

Development

None of the survey reports examined include data about the extent of CBIMT development. All, however, contain information about the level of CBIMT use (Hirschbuhl, 1989;

Geber, 1989; Communications Canada & Industry, Science and Technology Canada, 1990; Larson & Blue, 1991). As well in the Training and Development Journal's January 1988 survey, the amount of training delivered by Interactive Multimedia was compared to that delivered by other training methods.

Data Collection, Treatment and Presentation

In question 2.1 respondents were asked if their organizations developed Computer-based Interactive Multimedia Training. Those whose organizations did were directed to section three. In question 3.1 respondents were asked whether the courseware was being developed for internal use or for external organizations. In the treatment, responses to questions 2.1 and 3.1 have been analyzed as functions of the demographic data from section one. The data are presented in tables.

In question 2.2 respondents were asked whether or not their organizations used CBIMT. These data have also been analyzed as a function of the data from section one and are presented in table form. In questions 4.1 and 5.1 those whose organizations used CBIMT were asked how much training was delivered by Interactive Multimedia as compared to other training methods. Data in the form of counts and percentages are presented in table form.

Subproblem 2

Do Respondent organizations plan to increase, maintain or decrease their development and/or use of CBIMT during the

coming year?

Development

At least two Canadian surveys included questions about intended use of CBIMT. In the 1989 Technologies in Services study, Canadian service industry companies were asked if they planned to use CBIMT within the next three years (Communications Canada & Industry, Science and Technology Canada, 1990) and in the 1991 Conference Board of Canada survey of Training and Development 1990: Expenditures and Policies training departments of a cross section of Canadian companies were asked if they planned to use CBIMT within the next two years (Larson & Blue, 1990). Because neither of these surveys have been repeated, it is difficult to judge the accuracy of the predictions.

Throughout the 1980's, Training magazine's annual October surveys of training in U.S. corporations reported the percentage of respondents not using computers in training but planning to in the coming year (Geber, 1989).

Data Collection, Treatment and Presentation

In questions 3.4, 4.9, 5.9, 6.2 and 6.3 respondents were asked about their future plans. Data collected using these questions have been analyzed as functions of the demographic data from section one and presented in tables.

Subproblem 3

What computer authoring software do respondent organizations use to deliver CBIMT?

Development

Authoring software varies in price, ease of use, and type of machine on which the resulting authorware runs. Choice of authoring software can affect the cost of development and subsequent implementation.

Mention of authoring software was contained in reports of CBIMT use by individual companies and government departments. None of the survey reports examined included data about authoring systems used.

Data Collection, Treatment and Presentation

In question 3.3 respondents were asked which authoring system they used. Various authoring programs were listed as choices. An "other" category was included to ensure that no type was missed. Results were tabulated with the frequency of each authoring program indicated both as a count and a percentage of respondents.

Subproblem 4

What computer hardware do respondent organizations use to deliver CBIMT?

Development

Both the Conference Board of Canada and the Training magazine reports contain data about types of computers used by training departments (Geber, 1989; Larson & Blue, 1990). In the Conference Board of Canada report the type of use is unclear while in the Training magazine reports, it is use for all purposes.

Data Collection, Treatment and Presentation

Questions 4.6 and 5.6 lists various categories of computer equipment as choices for answers to the question. An "other" category was included to ensure that no type was missed. The data have been tabulated with the frequency of each computer type indicated both as a count and a percentage of respondents.

Subproblem 5

For what job categories and types of skills is Computer-based Interactive Multimedia Training used?

Development

Both the Hirschbuhl and Training magazine surveys contain questions about the job and skill categories for which Computer-based Interactive Multimedia Training is used (Hirschbuhl, 1989; Geber, 1989).

Data Collection, Treatment and Presentation

In questions 4.4 and 5.4 of the survey, respondents were asked what job categories received training using Interactive Multimedia while in questions 4.5 and 5.5, they were asked about skill categories. The data have been tabulated with the frequency of job and skill categories indicated both as counts and percentages of respondents.

Subproblem 6

What do respondent organizations perceive to be the advantages of Computer-based Interactive Multimedia Training?

Development

In his study, Hirschbuhl investigated the reasons firms use CBIMT (Hirschbuhl, 1989). Experimental studies point to several advantages of Computer-based Interactive Multimedia Training (Kulik, Kulik, & Cohen, 1980).

Data Collection, Treatment and Presentation

In questions 4.7 and 5.7 advantages of Computer-based Interactive Multimedia Training were listed for respondents to choose from. An "other" category was included for responses that were not listed. Respondents were asked to rank the advantages.

The frequencies of the rankings of the perceived advantages are presented in table format. The rankings are grouped.

Subproblem 7

What do respondents perceive to be the disadvantages of Computer-based Interactive Multimedia Training?

Development

Factors causing Computer-based Interactive Multimedia Training to fail were investigated in Hirschbuhl's study (Hirschbuhl, 1989).

Data Collection, Treatment and Presentation

Questions 4.8, 5.8 and 6.1 list disadvantages of Computer-based Interactive Multimedia Training. In these questions respondents were asked to rank the disadvantages. An "other" category was included for responses that were not

listed. The responses to these questions are given ordinal rankings and descriptive statistics calculated. The frequencies of the rankings of the perceived disadvantages are presented in table format with the rankings grouped.

CHAPTER FOUR

FINDINGS

Subproblem 1

To What Extent are Survey Respondents Developing CBIMT?

Table IV-1 shows that of the 44 respondents, 12 or 27.3% developed CBIMT. There were more developers of CBT than of both CBT and CBIVT. There were no developers of CBIVT only. This may mean that all developers of CBIVT also developed CBT. If, however, some developers thought that the inclusion of computer text and graphics in CBIVT makes it CBT, they could have answered that they also develop CBT even if they developed CBIMT only.

Table IV-1

Development of CBIMT by Respondent Organizations

CBIMT Development	Count	Count Percent
CBT but not CBIVT.....	7	15.9%
both CBT and CBIVT.....	5	11.4%
Neither CBT nor CBIVT.....	32	72.7%
Total Cases.....	44	100.0%

To what extent are survey respondents developing CBIMT as a function of business activity?

The highest proportion of organizations developing CBIMT was in the financial, real estate, insurance or

banking sector. No manufacturing or retail/wholesale trade organizations developed CBIMT (Table IV-2).

Table IV-2

Development of CBIMT as a Function of Business Activity

Primary Business Activity	Development of CBIMT			Total Cases
	CBT but not CBIVT	both CBT and CBIVT	Neither CBT nor CBIVT	
Manufacturing.....			1	1
Retail/Wholesale Trade.....			3	3
Resource.....	1		3	4
Financial, Real Estate, Insurance or Banking.....	3		2	5
Business Services...	1	2	4	7
Government.....	1		8	9
Health Care/Medical.	1		1	2
Educational Services		2	6	8
Transportation, Utilities, Communications...		1	4	5
Total Cases.....	7	5	32	44

The primary business activities of organizations developing courseware for sale to external customers were business and educational services and transportation, utilities and communications. Those in the business and educational services sectors developed only for external sale while the organization in the transportation, utilities and communications sector developed both for internal use and for sale (Table IV-3).

Table IV-3

Purpose of CBIMT Development As a Function of Business Activity

Primary Business Activity	Purpose of Development				Total Cases
	Internal for sale to external organizations	Joint effort with end user for revenue	Internal for internal use	Joint effort with outside development firm for internal use	
Resource.....			1		1
Financial, Real Estate, Ins. or Banking.....			1	2	3
Bus. Services	2	1			3
Government.....			1		1
Health Care/Med.			1		1
Educ. Services	2	2			2
Transportation, Utilities, Communications..	1		1		1
Total Cases.....	5	3	5	2	12

There were seven organizations in the business services sector and eight in the educational services sector (table IV-3). Reference to the names of the organizations revealed that of these 15 business and educational services organizations, nine developed and/or delivered training to external customers. Five of these nine developed CBIMT (table IV-3). Four of the five developed both CBT and CBIVT while one developed CBT only. No business and education

service organizations developed CBIMT for internal training.

The only other organization developing for external sale was in the transportation, utilities, and communications sector. That organization developed both CBT and CBIVT and developed for internal use as well as for external sale (tables IV-2 & IV-3). Developers in other sectors developed solely for internal use.

The above organization was the only one of the five CBIVT developers to develop for internal use. The expense, equipment and expertise needed to produce the video portion of CBIVT may discourage all but specialized multimedia producers and very large organizations from producing it.

To what extent are survey respondents developing CBIMT as a function of the total number of employees?

Tables IV-4 and IV-5 show a U shaped distribution of developers. Almost half of the organizations with fewer than 250 employees developed CBIMT while only 21% of those with more than 1000 employees did so. Organizations with between 249 and 1000 employees did not develop CBIMT.

Table IV-5 shows that large organizations developed CBIMT for internal use while small organizations developed it for sale. Five of the seven organizations that developed CBIMT for internal use had more than 1000 employees. Two had between 100 and 249 employees. Only organizations with fewer than 250 employees developed exclusively for sale. The one organization with more than 1000 employees that sold

the courses it developed, also used them internally.

Table IV-4

CBIMT Development as a Function of Number of Employee

Number of Employees in North America	Development of CBIMT			Total Cases
	CBT but not CBIVT	both CBT and CBIVT	Neither CBT nor CBIVT	
Over 1000.....	4	1	19	24
500 - 999.....			3	3
250 - 499.....			2	2
100 - 249.....	2	1	3	6
50 - 99.....			1	1
Under 50.....	1	3	3	7
Total Cases.....	7	5	31	43

Table IV-5

Purpose of CBIMT Development as a Function of Number of Employees in North America

Number of Employees	Purpose of Development				Total Cases
	Internal for sale to external organi-	Joint effort with end user for revenue	Internal for internal use	Joint effort with develpmt firm for internal use	
Over 1000.....	1		3	2	5
100 - 249.....	1	1	2		3
Under 50.....	3	2			4
Total Cases.....	5	3	5	2	12

To what extent are survey respondents developing CBIMT as a function of the number of physical locations?

Like number of employees, number of branches is an indicator of an organization's size. The findings presented in tables IV-6 and IV-7 on the next page show the same U shaped distribution revealed in tables IV-4 and IV-5. Only organizations with more 30 or fewer than 10 branches, developed CBIMT. Those having between 10 and 30 did not.

Organizations developing for internal use were larger than those developing for sale. Five had more than 30 branches while two had fewer than 10. The organization with only one branch was the computer department of a much larger organization. The developer for external use with over 10 branches also developed for internal use (Table IV-7).

Table IV-6

CBIMT Development As a Function of Number of Branches

Number of Branches North America	Development of CBIMT			Total Cases
	CBT but not CBIVT	both CBT and CBIVT	Neither CBT nor CBIVT	
Over 40.....	3	1	8	12
31 - 40.....	1		1	2
21 - 30.....			1	1
11 - 20.....			6	6
2 - 10.....	1	2	5	8
One.....	2	2	10	14
Total Cases.....	7	5	31	43

Table IV-7

Purpose of CBIMT Development as a Function of Number of Branches

Number of Branches	Purpose of Development				Total Cases
	Internal for sale to external organizations	Joint effort with end user for revenue	Internal for internal use	Joint effort with outside development firm for internal use	
Over 40.....	1		3	1	4
31 - 40.....				1	1
2 - 10.....	2	1	1		3
One.....	2	2	1		4
Total Cases.....	5	3	5	2	12

To what extent are survey respondents developing CBIMT as a function of the annual expenditure for training?

Table IV-8 shows that organizations that spent between $50,000 and $75,000 on training, did not develop CBIMT. Assuming a relationship between size and total amount spent on training, this substantiates the observation that the midsize organizations surveyed did not develop CBIMT.

Table IV-9, shows that organizations developing CBIMT solely for sale spent less on training than did those that developed for internal use. As organizations that developed solely for sale were much smaller, this shows a direct relationship between size and amount spent on training.

Table IV-8

CBIMT Development As a Function of Training in Alberta

Amount Spent on Training in Alberta	Development of CBIMT			Total Cases
	CBT but not CBIVT	both CBT and CBIVT	Neither CBT nor CBIVT	
Over $150,000.....	3	1	16	20
100,000 - 149,999....	2		2	4
50,000 - 74,999.....			2	2
25,000 - 49,999.....		2	2	4
Under 25,000.....	1	2	7	10
Total Cases.....	6	5	29	40

Table IV-9

Purpose of CBIMT Development as a Function of Amount Spent on Training in Alberta

Amount Spent on Training in Alberta	Purpose of Development				Total Cases
	Internal for sale to external organizations	Joint effort with end user for revenue	Internal for internal use	Joint effort with outside development firm for internal use	
Amount Spent on Training in AB.					
Over $150,000...	1		4		4
100,000-149,999.			1	1	2
25,000-49,999...	2	1			2
Under 25,000....	2	2			3
Total Cases.....	5	3	5	1	11

To what extent are survey respondents developing CBIMT as a function of the number of full time equivalent training staff employed by the organization?

Half of the organizations with over 10 full time equivalent training staff developed CBIMT while a much smaller proportion of those with five or fewer did so. Those with 6 - 10 full time equivalent training staff did not develop CBIMT (table IV-10).

Table IV-10

CBIMT Development As a Function of Number of Training Staff in Alberta

Number of Training Staff in Alberta	Development of CBIMT			Total Cases
	CBT but not CBIVT	both CBT and CBIVT	Neither CBT nor CBIVT	
Over 10.....	2	2	4	8
6 - 10.....			3	3
1 - 5.....	4	2	15	21
None.....	1	1	9	11
Total Cases.....	7	5	31	43

Three of the four developers with more than 10 full time equivalent training staff in Alberta developed CBIMT for internal use. One of these organizations also sold to external organizations. Only one organization developing CBIMT solely for sale had more than 10 full time equivalent training staff in Alberta. Four of the seven organizations

developing CBIMT for internal use and four of the six organizations developing for sale had five or fewer full time equivalent training staff in Alberta. Table IV-11 thus confirms the size dichotomy between developers for internal use and developers for sale.

Table IV-11

Purpose of CBIMT Development As a Function of Number of Training Staff in Alberta

Number of Training Staff in Alberta	Purpose of Development				Total Cases
	Internal for sale to external organizations	Joint effort with end user for revenue	Internal for internal use	Joint effort with outside development firm for internal use	
Over 10.....	2	1	3		4
1 - 5.....	2	2	1	2	6
None.....	1		1		2
Total Cases.....	5	3	5	2	12

To what extent are survey respondents developing CBIMT as a function of the average number of days spent in training per employee in Alberta?

No organization that provided an average of 8 - 10 days training per year per employee developed CBIMT. Among the rest, organizations providing more training were somewhat

more likely to develop CBIMT (table IV-12).

Table IV-12

CBIMT Development As a Function of the Average Number of Training Days per Employee

Average Number of Days Training per Employee	Development of CBT/CBIVT			Total Cases
	CBT but not CBIVT	both CBT and CBIVT	Neither CBT nor CBIVT	
Over 10.....	1	2	5	8
8 - 10.....			4	4
4 - 7.....	4	1	10	15
Under 4.....	1	2	11	14
Total Cases.....	6	5	30	41

Table IV-13

Purpose of CBIMT Development As a Function of the Average Number of Training Days per Employee

Average Number of Training Days Per Employee in Alberta	Purpose of Development				Total Cases
	Internal for sale to external organizations	Joint effort with end user for revenue	Internal for internal use	Joint effort with development firm for internal use	
Over 10.....	2	1		1	3
4 - 7.....	1	1	4		5
Under 4.....	2	1	1		3
Total Cases.....	5	3	5	1	11

Eighty three percent of the organizations that developed for internal use, provided their employees with more than three days training per year compared to 60% of those developing for external sale (Table IV-13).

Two types of respondent organizations developed CBIMT: relatively large organizations that developed for internal use and relatively small organizations that developed for sale to external organizations. The latter were all in the business and educational services sectors. One developer, while developing chiefly for internal use, also sold courses to external organizations. Medium sized organizations did not develop CBIMT.

To What Extent are Survey Respondents Using CBIMT?

To determine the extent of CBIMT use, respondents were asked if their organizations used CBT and/or CBIVT. Those that answered in the affirmative were asked what proportion of their organizations' training was done using CBIMT.

Table IV-14 shows that 45.5% of respondents' organizations used CBIMT while 54.5% did not.

Table IV-14

Use of CBIMT by Respondent Organizations

CBIMT Use	Count	Count Percent
CBT but not CBIVT.....	11	25.0%
both CBT and CBIVT.....	9	20.5%
Neither CBT nor CBIVT.....	24	54.5%
Total Cases.....	44	100.0%

To What Extent are Survey Respondents Using CBIMT as a Function of Business Activity?

Organizations in the goods producing (manufacturing and resource), the financial, real estate, insurance or banking and the transportation, utilities and communications sectors used CBIMT the most. Those in the retail and wholesale trade, government, and education services sectors used it the least (table IV-15).

Table IV-15

CBIMT Use as a Function of Primary Business Activity

Primary Business Activity	Use of CBIMT			Total Cases
	CBT but not CBIVT	both CBT and CBIVT	Neither CBT nor CBIVT	
Manufacturing.....	1			1
Retail/Wholesale Trade.....		1	2	3
Resource.....	2	2		4
Financial, Real Estate, Insurance or Banking.....	2	1	2	5
Business Services....	3	1	3	7
Government.....	1	1	7	9
Health Care/Medical..		1	1	2
Educational Services.	1		7	8
Transportation, Utilities, Communications....	1	2	2	5
Total Cases.....	11	9	24	44

To What Extent are Survey Respondents Using CBIMT as a Function of the Total Number of Employees?

Analysis of table IV-16 reveals the following:

- 37.5% of organizations with fewer than 100 employees used CBIMT
- 50% with between 100 and 499 employees used CBIMT
- 0% with between 500 and 1,000 employees used CBIMT
- 54.2% with more than 1000 employees used CBIMT.

In summary, about 54% of the 24 organizations with more than 1000 employees used CBIMT while 37% of the 19 organizations with fewer than 1000 employees used it.

Table IV-16

CBIMT Use as a Function of Number of Employees in North America

Number of Employees in North America	Use of CBT/CBIVT			Total Cases
	CBT but not CBIVT	both CBT and CBIVT	Neither CBT nor CBIVT	
Over 1000.....	7	6	11	24
500 - 999.....			3	3
250 - 499.....			2	2
100 - 249.....	2	2	2	6
50 - 99.....			1	1
Under 50.....	2	1	4	7
Total Cases.....	11	9	23	43

To What Extent are Survey Respondents Using CBIMT as a Function of the Number of Physical Locations?

Organizations with more branches used CBIMT more. Twelve of the 21 (57%) with over 10 branches used it while eight of the 22 (36%) with fewer did (Tables IV-17 & IV-18).

Table IV-17

CBIMT Use as a Function of Number of Branches in North America

Number of Branches in North America	Use of CBIMT			Total Cases
	CBT but not CBIVT	both CBT and CBIVT	Neither CBT nor CBIVT	
Over 40.....	3	3	6	12
31 - 40.....	2			2
21 - 30.....			1	1
11 - 20.....	2	2	2	6
2 - 10.....	1	1	6	8
One.....	3	3	8	14
Total Cases.....	11	9	23	43

Table IV-18

CBIMT Use as a Function of Number of Branches in North America (Responses Grouped)

Number of Branches in North America	Use of CBIMT			Total Cases
	CBT but not CBIVT	both CBT and CBIVT	Neither CBT nor CBIVT	
Number of Branches in North America				
Over 10.....	7	5	9	21
1 - 10.....	4	4	14	22
Total Cases.....	11	9	23	43

To What Extent are Survey Respondents Using CBIMT as a Function of the Annual Expenditure for Training?

Organizations that spent more on training, tended to use CBIMT more. The largest difference was in the use of CBIVT which is more expensive than CBT (Tables IV-19 & IV-20).

Table IV-19

CBIMT Use as a Function of Amount Spent on Training in Alberta

Amount Spent on Training in Alberta	Use of CBIMT			Total Cases
	CBT but not CBIVT	both CBT and CBIVT	Neither CBT nor CBIVT	
Over $150,000.....	5	6	9	20
100,000 - 149,999....	1	2	1	4
50,000 - 74,999.....			2	2
25,000 - 49,999.....			4	4
Under 25,000.....	4	1	5	10
Total Cases.....	10	9	21	40

Table IV-20

CBIMT Use as a Function of Amount Spent on Training in Alberta (Responses Regrouped)

Amount Spent on Training in Alberta	Use of CBT/CBIVT			Total Cases
	CBT but not CBIVT	both CBT and CBIVT	Neither CBT nor CBIVT	
Over $150,000.....	5	6	9	20
Under 150,000.....	5	3	12	20
Total Cases.....	10	9	21	40

To What Extent are Survey Respondents Using CBIMT as a Function of the Number of Full Time Equivalent Training Staff Employed by the Organization?

There is a weak relationship between use of CBIMT and number of training staff in Alberta. Table IV-21 shows over 50% use among organizations with 1 - 5 and over 10 training staff and 33 - 37% use among those with 6 - 10 and no training staff.

Table IV-21

CBIMT Use as a Function of the Number of Full Time Equivalent Training Staff in Alberta

Number of Training Staff in Alberta	Use of CBT/CBIVT			Total Cases
	CBT but not CBIVT	both CBT and CBIVT	Neither CBT nor CBIVT	
Over 10.....	2	3	3	8
6 - 10.....		1	2	3
1 - 5.....	7	4	10	21
None.....	2	1	8	11
Total Cases.....	11	9	23	43

To What Extent are Survey Respondents Using CBIMT as a Function of the Number of Training Days Per Employee in Alberta?

There is a weak relationship between use of CBIMT and number of days of training per employee in Alberta. Table IV-22 shows over 60% use among organizations with 1 - 7 and

over 10 average days training and 25 - 30% use among those with 8 - 10 and under four average days training.

Table IV-22

CBIMT Use as a Function of Number of Training Days Per Employee in Alberta

Average Days Training Per Employee in Alberta	Use of CBT/CBIVT			Total Cases
	CBT but not CBIVT	both CBT and CBIVT	Neither CBT nor CBIVT	
Over 10.....	3	2	3	8
8 - 10.....	1		3	4
4 - 7.....	4	5	6	15
Under 4.....	2	2	10	14
Total Cases.....	10	9	22	41

Among Organization Using CBT, What Proportion of Their Training is Delivered by CBT?

Only 10% of users used CBT for over 20% of their training. A greater proportion, 20.5%, used it for more than 20% of their individual training. No users used CBT for more than 20% of group training (tables IV-23 to IV-25).

Of the organizations doing more than 20% of total training using CBT, both were in the business services sector. One was small with fewer than 50 employees while the other was larger with between 100 and 249 employees. The smaller organization was also a developer of CBIMT.

Of the four organizations doing more than 20% of their

individual training using CBT, two were small organizations that also developed CBT while the other two were large organizations with several branches and over 1000 employees.

Table IV-23

Percentage of Total Training Delivered by CBT

Percentage Delivered	Count	Count Percent
0 - 20%.....	18	90.0%
21 - 40%.....	1	5.0%
81 - 100%.....	1	5.0%
Total Cases.....	20	100.0%

Table IV-24

Percentage of Individual Training Delivered by CBT

Percentage Delivered	Count	Count Percent
0 - 20%.....	15	78.9%
21 - 40%.....	2	10.5%
41 - 60%.....	1	5.3%
81 - 100%.....	1	5.3%
Total Cases.....	19	100.0%

Table IV-25

Percentage of Group Training Delivered by CBT

Percentage Delivered Delivered by CBT	Count	Count Percent
0 - 20%.....	19	100.0%

Among Organization Using CBIVT, What Proportion of Their Training is Delivered by CBIVT?

In no organization using CBIVT, was more than 20% of training delivered using that technology. In only one, was more than 20% of individual training delivered using it. That was an organization with over 1,000 employees in the retail and wholesale trade sector (tables IV-26 & IV-27).

Table IV-26

Percentage Total Training Delivered by CBIVT

Percentage Delivered	Count	Count Percent
0 - 20%.....	9	100.0%

Table IV-27

Percentage Individual Training Delivered by CBIVT

Percentage Delivered	Count	Count Percent
0 - 20%.....	8	88.9%
21 - 40%.....	1	11.1%
Total Cases.....	9	100.0%

Subproblem 2

Do Respondents Plan to Increase, Maintain or Decrease Their Development of CBIMT in the Coming Year?

Of organizations developing CBIMT, 58.3% planned to increase their development in the coming year. Ten of the 12 (83%), planned to increase or maintain it (table IV-28).

Table IV-28

Expected Future CBIMT Development

Expectation	Count	Count Percent
Decrease	2	16.7%
Same level	3	25.0%
Moderate increase	4	33.3%
Major increase	3	25.0%
Total Cases	12	100.0%

Do respondents plan to increase, maintain or decrease their development of CBIMT in the coming year as functions of business activity, number of employees, number of physical locations, annual expenditure for training, number of full time equivalent training staff, or average number of days spent in training per employee in Alberta?

The two organizations that planned to decrease their development of CBIMT were in the business and education services fields. One was a medium sized organization (100 - 249 employees and 2 - 10 branches) while the other was a

small organization (fewer than 50 employees and one branch).

The organizations that planned to continue to develop CBIMT at the same level were in the financial, real estate, insurance, or banking sector and had over 1000 employees. Organizations planning a moderate increase in their development of CBIMT included both small organizations which developed for sale and larger ones that developed for internal use. Major increases were planned by the one large developer in the resource sector and by two small organizations in the business and educational services sectors. The latter developed CBIMT for sale (Tables IV-29 - IV-31).

Table IV-29

Expected Future CBIMT Development as a Function of Primary Business Activity

Primary Business Activity	Expected Future CBIMT Development				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
Resource.....				1	1
Financial, Real Estate, Ins.... or Banking.....		3			3
Bus. Services	1		1	1	3
Government.....			1		1
Health Care/Med.			1		1
Educational Ser.	1			1	2
Transportation, Utilities, Communications.			1		1
Total Cases.....	2	3	4	3	12

Table IV-30

Expected Future CBIMT Development as a Function of Number of Employees in North America

Number of Employees in North America	Expected Future CBIMT Development				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
Over 1000.....		3	1	1	5
100 - 249.....	1		2		3
Under 50.....	1		1	2	4
Total Cases.....	2	3	4	3	12

Table IV-31

Expected Future CBIMT Development as a Function of Number of Branches in North America

Number of Branches in North America	Expected Future CBIMT Development				Total
	Decrease	Same level	Moderate increase	Major increase	
Over 40.....		2	1	1	4
31 - 40.....		1			1
2 - 10.....	1		2		3
One.....	1		1	2	4
Total Cases.....	2	3	4	3	12

All organizations that spent over $100,000 per year on training in Alberta were expected to maintain or increase development. Among the organizations that spent the least, one was expected to decrease development while a major increase was expected from the other two (Table IV-32).

Table IV-32

Expected Future CBIMT Development as a Function of the Amount Spent on Training in Alberta

Amount Spent on Training in Alberta	Expected Future CBIMT Development				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
Over $150,000....		1	2	1	4
100,000 - 149,999		1	1		2
25,000 - 49,999..	1		1		2
Under 25,000.....	1			2	3
Total Cases.....	2	2	4	3	11

Table IV-33 reveals little relationship between expected future development and the number of training staff in Alberta. Organizations providing more training days, however, were more likely to be expected to increase their development of CBIMT (Table IV-34).

Table IV-33

Expected Future CBIMT Development as a Function of the Number of Training Staff in Alberta

Number of Training Staff in Alberta	Expected Future CBIMT Development				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
Over 10.....	1	1	1	1	4
1 - 5.....	1	2	1	2	6
None.....			2		2
Total Cases.....	2	3	4	3	12

Table IV-34

Expected Future CBIMT Development as a Function of Average Number of Days Training in Alberta

Average Days Training per Employee in Alberta	Expected Future CBIMT Developmt.				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
Over 10.....		1		2	3
4 - 7.....	1	1	2	1	5
Under 4.....	1		2		3
Total Cases.....	2	2	4	3	11

Do Respondents Plan to Increase, Maintain or Decrease Their Use of CBT in the Coming Year?

Table IV-35 shows that 55% of the respondents expected their organizations to increase the use of CBT in the coming year while only 5% expected a decrease in use.

Table IV-35

Expected Use of CBT in Coming Year

Expectation	Count	Count Percent
Decrease.....	1	5.0%
Stay at the same level.....	8	40.0%
Moderate Increase.....	9	45.0%
Major increase.....	2	10.0%
Total Cases.....	20	100.0%

Do respondents plan to increase, maintain or decrease their use of CBT in the coming year as functions of business activity, number of employees, number of physical locations, annual expenditure for training, number of full time equivalent training staff, or average number of days spent in training per employee in Alberta?

Tables IV-36 and IV-41 show only weak relationships between expected use of CBT and business activity, size, and commitment to training. Seven of the eight organizations expected to maintain the same level of CBT use had over 1000 employees. This group included all organizations in the financial, real estate, insurance or banking sector. While one of the three smallest organizations was expected to decrease CBT use, the others were expected to increase use.

Table IV-36

Expected Use of CBT in Coming Year as a Function of the Number of Employees in North America

Number of Employees in North America	Expected Use of CBT in the Coming Year				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
Over 1000.....		7	5	1	13
100 - 249.....		1	3		4
Under 50.....	1		1	1	3
Total Cases.....	1	8	9	2	20

Table IV-37

Expected Use of CBT in the Coming Year as a Function of Business Activity

Primary Business Activity	Expected Use of CBT in the Coming Year				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
Manufacturing.....			1		1
Retail/Wholesale Trade.....			1		1
Resource.....		2	1	1	4
Financial, Real Estate, Insurance or Banking.....		3			3
Business Services.	1	1	1	1	4
Government.....			2		2
Health Care/Med.			1		1
Ed. Services.....			1		1
Transportation, Utilities, Communications..		2	1		3
Total Cases.....	1	8	9	2	20

Table IV-38

Expected Use of CBT in Coming Year as a Function of the Number of Branches in North America

Number of Branches in North America	Expected Use of CBT in the Coming Year				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
Over 40.....		2	4		6
31 - 40.....		2			2
11 - 20.....		2	1	1	4
2 - 10.....		1	1		2
One.....	1	1	3	1	6
Total Cases.....	1	8	9	2	20

While 46% of the organizations with over 1,000 employees were expected to increase CBT use, 66% of those having over 40 branches and 64% of those spending over $150,000 on training, expected to increase their use of it. It is likely many of these organizations were the largest organizations among those having over 1,000 employees.

Table IV-39

Expected Use of CBT in Coming Year as a Function of Amount Spent on Training in Alberta

Amount Spent on Training in Alberta	Expected Use of CBT in the Coming Year				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
Over $150,000....		4	6	1	11
100,000 - 149,999		2	1		3
Under 25,000.....	1	1	2	1	5
Total Cases.....	1	7	9	2	19

Table IV-40

Expected Use of CBT in Coming Year as a Function of the Number of Training Staff in Alberta

Number of Training Staff in Alberta	Expected Use of CBT in the Coming Year				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
Over 10.....		2	3		5
6 - 10.....				1	1
1 - 5.....	1	6	3	1	11
None.....			3		3
Total Cases.....	1	8	9	2	20

Table IV-41

Expected Use of CBT in Coming Year as a Function of Average Number of Days Training per Employee in Alberta

Average Days Training per Employee in Alberta	Expected Use of CBT in the Coming Year				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
Over 10.....		2	2	1	5
8 - 10.....		1			1
4 - 7.....	1	4	3	1	9
Under 4.....			4		4
Total Cases.....	1	7	9	2	19

Do Respondents Plan to Increase, Maintain or Decrease Their Use of CBIVT in the Coming Year?

Five of the nine users (55.5%) expected to increase their use of CBIVT during the coming year while only one expected to decrease use (table IV-45).

Table IV-42

Expected Use of CBIVT in the Coming Year

Expected Use	Count	Count Percent
Decrease	1	11.1%
Stay at the same level	3	33.3%
Moderate increase	3	33.3%
Major increase	1	11.1%
No Response	1	11.1%
Total Cases	9	100.0%

Tables IV-43 to IV-48 show expected use of CBIVT as a function of business activity, size and commitment to employee training. Because of the small number of organizations using CBIVT, it is difficult to discover relationships between expected use and these factors.

Table IV-43

Expected Use of CBIVT in the Coming Year as a Function of Business Activity

Business Activity	Expected Use of CBIVT In the Coming Year				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
Primary Business Activity					
Retail/Wholesale Trade.....			1		1
Resource.....		1	1		2
Financial, Real Estate, Insurance or Banking....		1			1
Business Services				1	1
Government.....		1			1
Transportation, Utilities, Communications	1		1		2
Total Cases.....	1	3	3	1	8

Table IV-44

Expected Use of CBIVT in the Coming Year as a Function of Number of Employees in North America

Number of Employees in North America	Expected Use of CBIVT In the Coming Year				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
Over 1000.....	1	2	3		6
500 - 999.....		1			1
Under 50.....				1	1
Total Cases.....	1	3	3	1	8

Table IV-45

Expected Use of CBIVT in the Coming Year as a Function of Number of Branches in North America

Number of Employees in North America	Expected Use of CBIVT In the Coming Year				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
No. of Branches in North America					
Over 40.....		1	2		3
11 - 20.....		1	1		2
One.....	1	1		1	3
Total Cases.....	1	3	3	1	8

Table IV-46

Expected Use of CBIVT in the Coming Year as a Function of Amount Spent on Training in Alberta

Amount Spent on Training in Alberta	Expected Use of CBIVT In the Coming Year				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
Over $150,000....	1	3	2		6
100,000 - 149,999			1		1
Under 25,000.....				1	1
Total Cases.....	1	3	3	1	8

Table IV-47

Expected Use of CBIVT in the Coming Year as a Function of Number of Training Staff in Alberta

Number of Training Staff in Alberta	Expected Use of CBIVT In the Coming Year				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
Over 10.....	1	1	1		3
6 - 10.....		1			1
1 - 5.....			2	1	3
None.....		1			1
Total Cases.....	1	3	3	1	8

Table IV-48

Expected Use of CBIVT in the Coming Year as a Function of Average Days Training in Alberta

Average Days Training in Alberta	Expected Use of CBIVT In the Coming Year				Total Cases
	Decrease	Same level	Moderate increase	Major increase	
Over 10.....			1	1	2
4 - 7.....	1	2	1		4
Under 4.....		1	1		2
Total Cases.....	1	3	3	1	8

Do Organizations not Using CBIMT Plan to Implement or Investigate it During the Coming Year?

Of the respondents in organizations that did not use CBIMT 54.5% answered that their organizations did not plan

to implement it during the coming year. Only two stated that their organization did plan to implement CBIMT during the coming year (table IV-52).

Table IV-49

Non-users Plans to Implement CBIMT

Plans to Implement CBIMT	Count	Count Percent
Yes	2	9.1%
No	12	54.5%
Don't Know	8	36.4%
Total Cases	22	100.0%

There was more interest in investigating CBIMT. Six of the 22 respondents indicated that their organizations planned to investigate CBT or CBIVT (table IV-53).

Table IV-50

Non-users Plans to Investigate CBIMT

Plans to Investigate CBIMT	Count	Count Percent
Yes	6	27.3%
No	6	27.3%
Don't Know	10	45.5%
Total Cases	22	100.0%

Tables IV-51 to IV-62 show plans to implement or investigate CBIVT as a function of business activity, size

and commitment to employee training. Of the two organizations with plans to use CBIMT, one had over 1000 employees and was in the financial, real estate, insurance or banking sector while the other had fewer than 50 and was in the business services sector (tables IV-54 & IV-56). The latter was a developer of CBIMT.

Organizations with no known plans to implement CBIMT were engaged in most of the business activities defined in the questionnaire. None of the respondents in the retail/wholesale trade, health care/medical and transportation, utilities, and communications sectors knew if their organizations had plans to use CBIMT.

Table IV-51

Plans to Implement CBIMT as a Function of Business Activity

Business Activity	Plans to Implement CBIMT			Total Cases
	Yes	No	Don't Know	
Retail/Wholesale Trade.....			2	2
Financial, Real Estate, Insurance or Banking.....	1	1		2
Business Services....	1	2		3
Government.....		3	2	5
Health Care/Medical..			1	1
Educational Services.		6	1	7
Transportation, Utilities, Communications....			2	2
Total Cases.....	2	12	8	22

One or more organizations were expected to investigate CBIMT in all business sectors except for the retail/wholesale trade, health care/medical and transportation, utilities, and communications sectors. Respondents from these sectors did not know if their organizations had plans to investigate CBIMT.

Table IV-52

Plans to Investigate CBIMT as a Function of Business Activity

Business Activity	Plans to Investigate CBIMT			Total Cases
	Yes	No	Don't Know	
Retail/Wholesale Trade.....			2	2
Financial, Real Estate, Insurance or Banking.....	1	1		2
Business Services....	1	2		3
Government.....	2	1	2	5
Health Care/Medical..			1	1
Educational Services.	2	2	3	7
Transportation, Utilities, Communications....			2	2
Total Cases.....	6	6	10	22

Two organizations planned to implement CBIMT in the coming year. One was large having over 1,000 employees, over 40 branches, and large training budget. The other was small with under 50 employees, 2 - 10 branches, and a small

training budget. Both, however, had fewer than six full time equivalent training staff. Organizations with no plans to implement CBIMT and those whose implementation plans were not known, were of various sizes as measured by number of employees and number of branches. Their training budgets and numbers of training staff were similarly widely distributed (tables IV-53, IV-55, IV-57, IV-59, & IV-61).

All of the organizations that planned to investigate CBIMT had more than one branch and spent more than $25,000 per year on training. There was no noticeable relationship between organization size, amount spent on training, or the number of full time equivalent training staff and lack of plans to investigate CBIMT (tables IV-54, IV-56, IV-58, IV-60 & IV-62).

Table IV-53

Plans to Implement CBIMT as a Function of Number of Employees in North America

Number of Employees in North America	Plans to Implement CBIMT			Total Cases
	Yes	No	Don't Know	
Over 1000.....	1	4	6	11
500 - 999.....		1	1	2
250 - 499.....		2		2
100 - 249.....			1	1
50 - 99.....		1		1
Under 50.....	1	3		4
Total Cases.....	2	11	8	21

Table IV-54

Plans to Investigate CBIMT as a Function of Number of Employees in North America

Number of Employees in North America	Plans to Investigate CBIMT			Total Cases
	Yes	No	Don't Know	
Over 1000.....	3	1	7	11
500 - 999.....	1		1	2
250 - 499.....	1	1		2
100 - 249.....			1	1
50 - 99.....		1		1
Under 50.....	1	2	1	4
Total Cases.....	6	5	10	21

Table IV-55

Plans to Implement CBIMT as a Function of the Number of Branches in North America

Number of Branches in North America	Plans to Implement CBIMT			Total Cases
	Yes	No	Don't Know	
Over 40.....	1	2	2	5
21 - 30.....			1	1
11 - 20.....		1	1	2
2 - 10.....	1	2	2	5
One.....		6	2	8
Total Cases.....	2	11	8	21

Table IV-56

Plans to Investigate CBIMT as a Function of Number of Branches in North America

Number of Branches in North America	Plans to Investigate CBIMT			Total Cases
	Yes	No	Don't Know	
Over 40.....	2	1	2	5
21 - 30.....			1	1
11 - 20.....	1	1		2
2 - 10.....	3		2	5
One.....		3	5	8
Total Cases.....	6	5	10	21

Table IV-57

Plans to Implement CBIMT as a Function of the Amount Spent on Training in Alberta

Amount Spent on Training in Alberta	Plans to Implement CBIMT			Total Cases
	Yes	No	Don't Know	
Over $150,000.....	1	4	3	8
100,000 - 149,999....		1		1
50,000 - 74,999.....		1		1
25,000 - 49,999.....	1	1	2	4
Under 25,000.....		4	1	5
Total Cases.....	2	11	6	19

Table IV-58

Plans to Investigate CBIMT as a Function of the Amount Spent on Training in Alberta

Amount Spent on Training in Alberta	Plans to Investigate CBIMT			Total Cases
	Yes	No	Don't Know	
Over $150,000.....	3	1	4	8
100,000 - 149,999....			1	1
50,000 - 74,999.....	1			1
25,000 - 49,999.....	2	1	1	4
Under 25,000.....		3	2	5
Total Cases.....	6	5	8	19

Table IV-59

Plans to Implement CBIMT as a Function of the Number of Training Staff in Alberta

Number of Training Staff in Alberta	Plans to Implement CBIMT			Total Cases
	Yes	No	Don't Know	
Over 10.....		2	1	3
6 - 10.....			1	1
1 - 5.....	1	5	4	10
None.....	1	4	2	7
Total Cases.....	2	11	8	21

Table IV-60

Plans to Investigate CBIMT as a Function of the Number of Training Staff in Alberta

Number of Training Staff in Alberta	Plans to Investigate CBIMT			Total Cases
	Yes	No	Don't Know	
Over 10.....	1	1	1	3
6 - 10.....			1	1
1 - 5.....	3	1	6	10
None.....	2	3	2	7
Total Cases.....	6	5	10	21

Table IV-61

Plans to Implement CBIMT as a Function of Average Days Training per Employee in Alberta

Average Days Training per Employee in Alberta	Plans to Implement CBIMT			Total Cases
	Yes	No	Don't Know	
Over 10.....	1	2		3
8 - 10.....		1	2	3
4 - 7.....		3	2	5
Under 4.....	1	4	4	9
Total Cases.....	2	10	8	20

Table IV-62

Plans to Investigate CBIMT as a Function of Average Days Training per Employee in Alberta

Average Days Training per Employee in Alberta	Plans to Investigate CBIMT			Total Cases
	Yes	No	Don't Know	
Over 10.....	1	2		3
8 - 10.....			3	3
4 - 7.....	2		3	5
Under 4.....	3	2	4	9
Total Cases.....	6	4	10	20

Subproblem 3

What Authoring Software is Used by Survey Respondents?

Authorware Professional, Quest, and Macromind Director were the programs used most to author CBIMT (table IV-63).

Table IV-63

Authoring Software Used by Survey Respondents

Authoring Software Used	Count	Count Percent
Authorware Professional.....	3	25.0%
Quest.....	3	25.0%
Toolbook.....	1	8.3%
Wordprocessing program.....	1	8.3%
Amiga Vision.....	1	8.3%
Hypercard.....	1	8.3%
Macromind Director.....	2	16.7%
IBM Storyboard Live.....	1	8.3%
C Language.....	1	8.3%
No Response.....	3	25.0%
Total Cases.....	12	100.0%

Subproblem 4

What Computer Hardware do Survey Respondents Use to Deliver CBT?

All but one respondent organization used microcomputers to deliver CBT. Mainframes and minicomputers were used to a much lesser extent (table IV-64).

Table IV-64

Type of Computer Used to Deliver CBT

Type of Computer	Count	Count Percent
Microcomputer	19	95.0%
Minicomputer	1	5.0%
Mainframe	5	25.0%
Total Cases	20	100.0%

Among micro users, most used IBM or IBM combatable computers. Three of the organizations used Macintoshes (table IV-68).

Table IV-65

Type of Microcomputer Used to Deliver CBT

Type of Microcomputer	Count	Count Percent
IBM or clone	15	75.0%
Macintosh	3	15.0%
Wang	1	5.0%
No Response	2	10.0%
Total Cases	20	100.0%

What Computer Hardware do Survey Respondents Use to Deliver CBIVT?

All organizations used microcomputers to deliver CBIVT. Two thirds used IBM or IBM compatibles (tables IV-66 & 67).

Table IV-66

Type of Computer Used to Deliver CBIVT

Type of Computer	Count	Count Percent
Microcomputer.....	9	100.0%
Total Cases.....	9	100.0%

Table IV-67

Type of Microcomputer Used to Deliver CBIVT

Type of Microcomputer	Count	Count Percent
IBM or clone.....	6	66.7%
Macintosh.....	2	22.2%
Amiga.....	1	11.1%
Total Cases.....	9	100.0%

Subproblem 5

For What Job Categories is CBT Used?

CBT was used to train a broad spectrum of job categories. At least 50% of the organizations used CBT to train professional staff, technical staff and/or office/administrative support (table IV-68).

Table IV-68

Job Categories Trained Using CBT

Job Categories Trained	Count	Count Percent
Executives	1	5.0%
Professional staff	10	50.0%
Sales representatives	1	5.0%
Technical staff	12	60.0%
Office/Administrative support	11	55.0%
Managers	8	40.0%
Supervisors	9	45.0%
Production workers	5	25.0%
Customer service representative	5	25.0%
Total Cases	20	100.0%

For What Job Categories is CBIVT Used?

Technical staff, managers and supervisors most likely to receive CBIVT (table IV-69).

Table IV-69

Job Categories Trained Using CBIVT

Job Categories Trained	Count	Count Percent
Executives	1	11.1%
Professional staff	4	44.4%
Sales representatives	1	11.1%
Technical staff	7	77.8%
Office/Administrative support	4	44.4%
Managers	6	66.7%
Supervisors	7	77.8%
Production workers	3	33.3%
Customer service representatives	2	22.2%
Total Cases	9	100.0%

For What Types of Skills is CBT Used?

Table IV-70 shows that a broad range of skills were taught using CBT. Computer skills, especially word processing, were taught most followed by equipment operation and product knowledge.

Table IV-70

Skills Trained Using CBT

Skills Trained	Count	Count Percent
Remedial basic education	1	5.0%
Basic computer literacy	7	35.0%
Word processing	10	50.0%
Data processing	5	25.0%
Computer programming	4	20.0%
Product knowledge	4	20.0%
Time management	1	5.0%
Equipment operation	6	30.0%
Finance/Accounting	1	5.0%
Communication skills	1	5.0%
Problem-solving	2	10.0%
Customer relations/services	2	10.0%
Company orientation	1	5.0%
Safety	2	10.0%
Technical skills	1	5.0%
Management skills	2	10.0%
Trade - apprenticeship	1	5.0%
Total Cases	20	100.0%

For What Types of Skills is CBIVT Used?

CBIVT was used to teach a variety of skills. Communication and computer skills were the categories cited by the most respondents (table IV-71).

Table IV-71

Skills Trained Using CBIVT

Skills Trained	Count	Count Percent
Basic computer literacy	3	33.3%
Word processing	3	33.3%
Data processing	1	11.1%
Equipment operation	1	11.1%
Product knowledge	2	22.2%
Problem-solving	1	11.1%
Communication skills	4	44.4%
Customer relations/services	1	11.1%
Company orientation	1	11.1%
Safety	1	11.1%
Process knowledge	1	11.1%
Total Cases	9	100.0%

Subproblem 6

What do Survey Respondents Perceive to be the Advantages of CBT?

Respondents felt time flexibility and individualized instruction were the greatest advantages of CBT. Ranked next were employee independence and the increased training effectiveness then increased accountability and reduced training cost (Table IV-72).

Table IV-72

Perceived Advantages of CBT

Perceived Advantages	Rank				Total
	1 - 2	3 - 4	5 - 6	> 7	
Individualized instruction.....	9	4	2		15
Employee can train at own pace.....	6	10	1		17
Greater employee satisfaction with training method....	1	1	3	3	8
Time flexibility.....	11	3	3		17
Less costly than conventional ..... training	3	5		4	12
Greater training effectiveness.....	6	2	3		11
Reduced training time.		2	2	5	9
Ability to document and track learner performance.....	1	2		5	8
Increased accountability for training.....	1	2	4	3	10
Testing.....	1				1
Total.....					20

What do Survey Respondents Perceive to be the Advantages of CBIVT?

The most important advantages to CBIVT identified by the respondents were that it is individualized instruction, that employees can train at their own pace and that it is time flexible. Cost and training effectiveness were ranked next in importance (table IV-73).

Table IV-73

Perceived Advantages of CBIVT

Perceived Advantages	Rank				Total
	1 - 2	3 - 4	5 - 6	> 7	
Individualized instruction.....	4	4			8
Employee can train at own pace.....	4	3	1		8
Greater employee satisfaction with training method.....			1	2	3
Time flexibility.....	5		2		7
Less costly than conventional training.	1	3		1	5
Greater training effectiveness.....	2	2			4
Reduced training time....			2	1	3
Ability to document and track learner performance.....			1	2	3
Increased accountability for training.....				3	3
Safety factors.....		1		2	3
Total.....					9

Subproblem 7

What do Survey Respondents Perceive to be the Disadvantages of CBT?

The most prominent disadvantages of CBT identified by respondents were the availability and cost of courseware and commitment to other training methods. The cost of equipment and unrealistic expectations were next in importance and were also identified by a large proportion of the respondents (Table IV-74).

Table IV-74

Perceived Disadvantages of CBT

Perceived Disadvantages	Rank				Total
	1 - 2	3 - 4	5 - 6	7 - 12	
Cost of equipment.....	3	5	1	2	11
Cost of purchasing courseware.....	6	2	2	2	12
Cost of developing courseware.....	5	4	1		10
Lack of experienced courseware designers..	3	2	3		8
Lack of suitable courseware.....	7	1	2		10
Poor quality of courseware.....	2	3		3	8
Commitment to other training methods.....	5	3		2	10
Unrealistic expectations.	2	3	2	1	8
Loss of personal contact.		1			1
Total.....					20

What do Survey Respondents Perceive to be the Disadvantages of CBIVT?

Cost of equipment, software purchase and development and the lack of suitable courseware were the disadvantages to CBIVT highlighted by respondents.

Table IV-75

Perceived Disadvantages of CBIVT

Perceived Disadvantages	Rank				Total
	1 - 2	3 - 4	5 - 6	7 - 12	
Cost of equipment.....	3	2	1		6
Cost of purchasing courseware.....	2	2	1	1	6
Cost of developing courseware.....	2	2	1		5
Cost of producing video images.....		2		1	3
Difficulty in making changes to video disks of experienced courseware designers.. of suitable courseware.....	2		1		3
	1	1		1	3
	3	2			5
Poor quality of courseware.....	1			2	3
Commitment to other training methods.....	1		1	1	3
Unrealistic expectations.	1			2	3
Total.....					9

CHAPTER FIVE

DISCUSSION OF RESULTS, CONCLUSIONS, AND IMPLICATIONS FOR FURTHER STUDY

Subproblem 1

To What Extent are Survey Respondents Developing CBIMT?

Of the organizations surveyed, 27.3% developed CBIMT (table IV-1). None of the studies examined during the literature search contained comparable data about CBIMT development.

Among ASHROD organizations, there were two kinds of developers - large organizations that developed for internal use and small organizations that developed for external sale. Seven organizations, 35% of those that used CBIMT, developed for internal use (table IV-3). This large proportion is consistent with a trend toward growth in in-house development identified by Hirschbuhl in a 1987 study done for Computer Knowledge International. Hirschbuhl found that in-house development had grown from 1% of users in 1985 to 6% of users in 1987 (1989).

The seven organizations developing for internal use included three in the financial services sector and one each in the government, health, transportation, utilities, and communications, and resource sectors. Organizations in these sectors were also identified in the studies and periodical articles referred to in chapter two of this

thesis, as being among those most likely to use and develop CBIMT.

Hirschbuhl, for example, found the financial and health sectors to be among those with the largest commitment to in-house development. Among the 15 Canadian CBIMT users listed in chapter two, seven were financial services organizations, two were government organizations, and one was a resource company. Most of the courses used by these organizations were developed in-house. While no mention was made of CBIMT development in the Technologies in Services report, the industries found to use CBIMT most were in the communications and financial services sectors (Communications Canada & Industry, Science and Technology Canada, 1990).

Larger organizations were more likely to develop for internal use. Five of the seven organizations developing for internal use had over 1000 employees. These five were about 20% of all of those organizations with over 1000 employees. The two other developers for internal use had between 100 and 249 employees which was about 10% of all of the organizations with fewer than 1000 employees (table IV-4 & IV-5).

That larger organizations were more likely to develop for internal use was confirmed by responses to the questions about number of branches, amount of money spent on training and number of training staff. About one third of the

organizations with more than 40 branches and one quarter of those spending more than $100,000 per year on training developed for internal use. Half of the organizations having over 10 full time equivalent training staff developed CBIMT compared to less than one quarter of those with fewer than 10 full time equivalent training staff (tables IV-6, IV-8 & IV-10).

Tables IV-74 and IV-75 show that cost of development was judged to be an important disadvantage of CBIMT. Cost of development was also mentioned in the report of the Hirschbuhl study as a problem of CBT (Hirschbuhl, 1989). Among organizations with more than 1000 employees, where there was a commitment to the use of CBIMT, employment of a development team may have been considered by some to be cost effective. Among smaller organizations, it may have been perceived to be less expensive to purchase courseware than to develop it internally.

Two organizations with fewer than 250 employees, one a health care provider and the other a government department, developed for internal use. This may indicate that declining hardware and software costs and improved authoring systems are bringing CBIMT development within reach of smaller organizations (table IV-5).

Of the six organizations developing for sale, one was a large organization which also developed for internal use. It shared the characteristics of the other organizations

developing for internal use. The other five organizations developing for sale were in the business or educational services sectors (tables IV-3 & IV-5).

These five constituted more than half of the organizations in the business and educational services sectors that developed and/or delivered any type of training to external organizations. This suggests a high level of awareness of CBIMT among training vendors and a perception that there is client demand for it.

The five business and educational service organizations were much smaller than the organizations that developed for internal use. Four had under 50 employees and one had between 100 and 249 employees. All had fewer than 10 branches and spent less than $50,000 per year on training. They did, however, show a strong commitment to training their own employees, with all but one having at least one trainer employed (tables IV-3 & IV-5).

These data suggest that while there was enough business to enable a number of organizations to produce CBIMT in Edmonton, none had grown to have over 250 employees or more than 10 branches in Alberta. This may be because the amount of CBIMT development business is too small to support larger organizations or to attract larger national or international organizations into the local market or because the nature of CBIMT development favours small specialized organizations. It could also be that larger development organizations exist

in Edmonton but that no representatives of these had joined ASHROD.

The lack of medium-sized organizations among developers could be because such organizations were too small to develop CBIMT for internal use and because no organizations having 250 or more employees had entered the Edmonton CBIMT market.

To What Extent are Survey Respondents Using CBIMT?

Of the organizations surveyed, 45.5% used CBT. This is much higher than the 22% usage rate among the Canadian service companies surveyed in the Technologies in Services study conducted in March 1989 (Communications Canada & Industry, Science and Technology Canada, 1990). It is also higher than the 11% of organizations surveyed by the Conference Board of Canada that used computer software for course delivery. It was close to the 43% use rate shown by Training magazine's 1992 survey (Filipczak, 1992). Twenty decimal five percent used both CBT and CBIVT. This compared to 14% of respondents to the 1992 Training magazine survey.

As in the case of development of CBIMT, the high rate of usage shown by the ASHROD survey may be because organizations employing training professionals are committed to training and so more likely to use CBIMT.

There was variation in usage among industry groups, with manufacturing, resource, financial, real estate insurance and banking and transportation, utilities and

communications organizations using CBIMT the most and retail and wholesale trade, government and education services organizations using it the least. This pattern of use was similar for both use of CBT alone and use of CBT and CBIVT (table IV-15).

These results were consistent with the results of the Technologies in Services study which showed the communications and finance and insurance industries used CBIMT the most and the retail trade and accommodation and food industries used it the least (Communications Canada & Industry, Science and Technology Canada, 1990).

Differences in types of organizations surveyed may partially account for the difference in CBIMT use revealed by the ASHROD and Technologies in Services studies. The latter study was a survey of service industries so governments and the goods producing industries, medium and high use sectors, were not included. The accommodation and food industry, a low use sector was included. There were no organizations in this sector among respondents to the ASHROD survey.

Another factor may be the timing of the studies. The Technologies in Services study was conducted in March 1989 while the ASHROD survey was conducted in the winter of 1992. Of the companies surveyed in the earlier study, 11% of those not using CBIMT, planned to use in within three years. Among companies in communications and finance and insurance

sectors, 19% and 20% of non users planned to begin using these training technologies within this time span. The results of the ASHROD survey are consistent with that projected growth (Communications Canada & Industry, Science and Technology Canada, 1990).

In the study done for Computer Knowledge International Hirschbuhl surveyed several industries not included in the ASHROD survey. Two of those, the airline and data processing industries, were found to be the heaviest users of CBIMT. However, where the industries were the same, the findings agree. The second highest level of use was in the banking industry. The third highest were the insurance and manufacturing industries. These three industries are in the sectors that were shown in the ASHROD study to use CBIMT the most (Hirschbuhl, 1989).

The survey findings showed that organizations with more than 1,000 and fewer than 250 employees were more likely to use CBIMT. Tables V-1 and V-2 below compare the Ashrod findings with those of the Training magazine and the Technologies in Services studies (Communications Canada & Industry, Science and Technology Canada, 1990).

Table V-1

Percentage of Organizations Using CBT in 1992 by Number of Employees

Study	Number of Employees					
	Less than 100	100 -499	500 -999	1,000 -2,499	2,500 - 9,999	10,000 or more
Training		41.0	53.0	41.0	53.0	72.0
ASHROD	37.5	50.0	0.0	54.2		

The Training magazine surveys of 1985 to 1992 showed that the more employees an organization had, the more likely it was to use of CBIMT. During the period, the gap in use between the smaller and larger organizations decreased with the smaller organizations growing faster than the large ones (table II-4).

In table V-1, the ASHROD figures are compared to the 1992 Training magazine figures (Filipczak, 1992). Considering the small population of the ASHROD study the percentages are very close. The exception is the 500 to 999 employee category. In that category, there were only three respondents to the ASHROD survey. One was a government department and the other two were educational organizations. As shown by survey results, these sectors were among those that used CBT the least so business activity was likely a more important factor in their lack of CBT use than size.

In the 100 to 499 employee category, there was a higher

percentage of users among ASHROD member' organizations than among Training magazine respondents. With only eight ASHROD respondents in that category, the Training magazine and ASHROD figures can be considered equivalent. In the over 1,000 employee category, the 54% use rate of the ASHROD survey is very close to the 53% of users in Training magazine's 2,500 to 9,999 category. The mean of the three over 1,000 employee categories in the Training magazine survey is 55.3%, also very close to the ASHROD figure.

In the Technologies in Services study (Communications Canada & Industry, Science and Technology Canada, 1990), companies with fewer than 200 employees were compared to those with more than 200 employees. The closest category limit in the ASHROD survey was 250 employees. As shown in table V-2, the Technologies in Services study followed the expected pattern of greater use by larger organizations. The ASHROD survey showed the opposite. This can be explained by the lack of use by midsized organizations discussed above.

Table V-2

Percentage of Organizations Using CBT in 1992 by Number of Employees

Study	Number of Employees	
	Less than 200/250	200/250 or more
Technologies in Services	17	28
ASHROD	50	45

As more than half of those responding to the ASHROD survey worked for organizations with over 1,000 employees, a more accurate picture of the distribution of CBT use may be gained by comparing organizations with more than 1,000 employees those having fewer than 1,000 employees. Of organizations with more than 1000 employees, 54.2% used CBT, while only 36.8% of those with fewer did (table IV-16).

Of the studies discussed in chapter 2, only the training magazine surveys included measures of the use of CBIVT. Table V-3 shows the findings of the ASHROD survey and the most comparable available data from the Training magazine surveys.

The most recent Training magazine report to include a percentage for use of CBIVT by a segment of the surveyed sample is the October 1990 issue. In that report there is a figure for use of CBIVT by organizations with over 10,000 employees. The largest size category in the ASHROD survey

was of organizations with over 1,000 employees. Although the Training magazine segment was of larger organizations, the percentage use was only 5% more than for the ASHROD segment.

Table V-3

Percentage of Organizations Using CBIVT by Number of Employees

Study	Number of Employees	Percentage Using CBIVT
Training Magazine 1990	more than 10,000	30
ASHROD 1992	more than 1,000	25
Training Magazine 1992	All sizes	14
ASHROD 1992	All sizes	20

When percentages for organizations of all sizes are compared, using 1992 studies, the percentage of users among organizations in the ASHROD survey was higher than among those in the Training magazine survey (table V-3).

Among the population of organizations included in the ASHROD survey, the use of CBIVT was quite high when compared to use by the U.S. companies responding to the Training magazine surveys. The greater use by larger organizations shown by all of these studies, confirms the direct relationship between size and use of CBIMT noted in the analysis of CBT use.

None of the reports discussed in chapter 2 included examination of CBIMT as a function of the number of branches in North America, amount spent on training, number of training staff, or average days training per employee in Alberta.

In the ASHROD survey, larger organizations as measured by number of branches and amount spent on training in Alberta, were shown to use CBIMT more. This substantiates the greater use of CBIMT by larger organizations shown by the analysis of the use of CBIMT as a function of number of employees above and by the Training magazine surveys.

The number of days training per employee in a year is not a function of the size of the organization. The weak relationship between CBIMT use and that measure suggests that it is less important than business activity and size as an indicator of level of CBIMT use.

Proportion of Training Delivered by CBIMT

Ten percent of the organizations that used CBIMT or 4.5% of all respondent organizations used it for more than 20% of their training (table IV-23). No organizations used CBIVT for more than 20% of their training (table IV-26). The Hirschbuhl study, conducted in late 1987, showed that "across industry ... 20 to 30 percent of data processing training is done with CBT and 3 to 7 percent of all other training is done with CBT." (1989)

The inclusion of ranges below 20% use in the survey

questions concerning proportion of training delivered by CBIMT would perhaps have elicited more useful data.

Subproblem 2

Do Respondents Plan to Increase, Maintain or Decrease Their Development of CBIMT in the Coming Year?

Because the ASHROD study was the first survey of CBIMT development and use by that population, the question about growth expectations was asked to gain an indication about level of satisfaction and future growth.

Seven of the 12 developers planned to increase their development in the coming year. Two planned to decrease their development and three planned to keep it at the same level (table IV-26).

The two organizations expecting to decrease their development of CBIMT were small and medium sized organizations in the business services and education services fields that developed CBIMT for sale. Such organizations usually develop courseware only on a contract basis so the decreases may have been due to a lack new development contracts. It may also have been due to a retreat from the CBIMT development business.

Of the other small development houses, one planned a moderate increase and the other two expected major increases in development work. This indicates optimism and suggests that these organizations have experience of success in the

CBIMT development business.

Among organizations developing for internal use, three of the five largest organizations expected to continue at the same level of development. All three of these were in the financial, real estate, insurance, or banking sector. This sector was shown in both the literature review and this study to have a long standing commitment to CBIMT use and development. It may be that for these organizations CBIMT development has matured and stabilized.

One organizations developing for internal use expected a major increase in future CBIMT development. That organization had over 1,000 employees and was in the resource sector. The other three developers expected a moderate increase in development. That four of the seven organizations developing for internal use expected to increase their development activities indicates satisfaction with their development activity (table IV-29 & table IV-30).

Of the surveys discussed in chapter 2, only the Hirschbuhl study contained questions about development of CBIMT. That study included a survey and extensive literature search. While no questions about expected development were included in the survey questionnaire, Hirschbuhl reported a steady growth in in-house development. The percentage of courseware developed in-house increased from 1% in 1985 to 6% in 1987 (1989).

Do Respondents Expect Their Organizations to Increase, Maintain or Decrease Their Use of CBIMT in the Coming Year?

Eleven of the 20 users of CBT were expected to increase their use in the coming year, eight were expected to maintain the same level of use and one was expected to decrease CBT use (table V-28).

As noted in chapter 4, there was only a weak relationship between business activity, size, training budget and training per employee and expected use of CBT.

Of the seven organizations with fewer than 250 employees, five were expected to increase their use of CBT and one was expected to maintain it. The suggests successful experiences with CBT despite the cost disadvantage resulting from size.

Among the organizations with more than 1,000 employees, over half were expected to maintain but not increase their use of CBIMT. Three of these were the organizations in the financial, real estate, insurance or banking sector. The Training magazine surveys have shown that use of CBT by larger organizations has been at a high level for several years and has grown more slowly during recent years. With established systems in place, these larger organizations may no longer have been in a growth phase of CBT use (tables V-29 & V-30).

Organizations with more than 1,000 employees that were expected to increase their use of CBT were the largest ones

as determined by number of branches. Four of the six organizations with over 40 branches were expected to increase their use of CBT. One in the resource sector expected a major increase (table V-31).

That 95% of the respondent organizations were expected to maintain or increase their use of CBT indicates success with that training technology and suggests that the level of use among these organizations will grow.

Among CBIVT users, one organization was expected to decrease its use of CBIVT, three were expected to maintain use and four were expected to increase use. This suggests a similar level of satisfaction and growth potential among CBIVT users as among CBT users. Because of the small number of organizations using CBIVT, it is difficult to discover relationships between expected use and business activity, size, training budget or training per employee.

Do Respondents in Organizations not Presently Using CBIMT Expect Their Organizations to Implement or Investigate CBIMT in the Coming Year?

Among organizations not using CBIMT, two (4.5% of all of the respondent organizations) planned to implement it. This compares to the 11% of the companies in the Canadian Technologies in Services study (Communications Canada & Industry, Science and Technology Canada, 1990), that planned to use CBIMT within the next three years. The organizations planning to implement CBIMT were in the divergent high use

groups consistently showing up in study results. That is, one had over 1000 employees and was in the financial, real estate, insurance or banking sector while the other had fewer than 50 and was in the business services sector. The latter was a developer of CBIMT (tables IV-49, IV-51 & IV-53).

Over half of the non-users (54.5%) had no plans to use CBIMT during the following year. The majority of these organizations were in the educational sector. The others were in the financial, real estate, insurance or banking, business services and government sectors. These are sectors in which the level of awareness of training methods is high. The business services and education sectors are involved in selling training and education and the financial, real estate, insurance or banking and government sectors do more employee training than do most other business sectors. Respondents in these organizations may have been more aware of CBIMT and their organizations' plans because of greater awareness of training methods within their organizations.

In contrast, eighteen percent of all respondents did not know whether or not their organizations had implementation plans. These organizations were in all sectors except for finance, real estate, insurance or banking and business services. None of the non-users in retail/wholesale trade or the transportation, utilities, and communications sectors knew if their organizations had plans

to implement CBIMT. The retail sector especially is one shown by the Technologies in Services study to have a low level of CBIMT use and interest (Communications Canada & Industry, Science and Technology Canada, 1990).

Six respondents (27.3% of non-users) said that their organizations planned to investigate CBIMT. Two were the organizations that had plans to implement CBIMT and the rest were government and educational organizations which had no plans to implement in the coming year. Six respondents (27.3%) said that their organizations did not plan to investigate CBIMT. This was fewer than the 12 that had indicated that there were no plans to implement (tables IV-50, IV-52 & IV-54).

The other ten (48% of non-users) did not know if their organizations planned to investigate CBIMT. Two had indicated that their organizations had no plans to implement CBIMT while the rest had not known if their organizations planned to implement. The high proportion of respondents that did not know their organizations' plans suggests a lack of awareness of CBIMT on the part of these respondents and perhaps throughout their organizations.

All of the organizations that planned to investigate or implement CBIMT spent more than $25,000 per year on training in Alberta. Other than this indication of a commitment to training and the size dichotomy between the organizations expecting to implement CBIMT, size or commitment to training

were not strong indicators of plans to either investigate or implement CBIMT.

In the Training magazine surveys, non-users have been asked if they plan to use CBT in the coming year. Except for 1991, the subsequent year's growth was always less than that indicated by the proportion of non-users that had indicated that they did plan to use it. If growth in CBIMT use among non-users in the ASHROD survey follows the same pattern, during the next year or two, CBIMT use is likely to grow very slowly, if at all, among non-using organizations. However, with two organizations planning to implement during the coming year and six planning to investigate, there is may be more significant growth in use over the longer term.

Subproblem 3

What Authoring Software is Used by Survey Respondents?

Among the programs used to develop CBIMT courseware, four were programs designed as multimedia authoring tools: Authorware Professional, Quest, Amiga Vision and IBM Storyboard Live. Authorware Professional and Quest were each used by three organizations. Some of these organizations used additional programs in the development of their courseware. One Authorware Professional user also used Macromind Director and Hypercard. Macromind Director is an animation program and was probably used to produce animation to be used in courseware programmed with

Authorware. Hypercard, while not designed solely for authoring, has multimedia and interactive capabilities and was likely used for development independent of the use of Authorware.

A Quest user used Macromind Director and the C language. In this case it is likely that both tools were used in conjunction the authoring system. Another Quest user used Toolbook. This program is a hypermedia program functionally similar to Hypercard. It was likely used separately from Quest.

The other non-authoring system that was used was a wordprocessor. This is an unlikely choice for authoring as most wordprocessing programs have few features for programming interactivity. Its use suggests a creative approach to the use of computers in training.

Subproblem 4

What Computer Hardware do Survey Respondents Use to Deliver CBIMT?

Microcomputers were used to deliver 95% of the CBT and all of the CBIVT of the respondent organizations. Only 5% was delivered on minicomputer and 25% was delivered by mainframe.

Sixty eight percent of the organizations represented in the Conference Board of Canada survey (Larson & Blue, 1990) or 83% of those that used computers, used PCs. While this

data is not specific to the delivery of CBIMT, it is consistent with the pattern of computer use revealed by the ASHROD survey (table II-3).

The Conference Board of Canada (Larson & Blue, 1990) and 1991 Training magazine (Geber, 1991) surveys identified the types computers used for all training functions combined - administration and material preparation as well as CBIMT. These studies showed a similar high level of use of microcomputers to that revealed by the ASHROD survey (tables II-3, II-6 & IV-64).

Respondents to the Conference Board of Canada and Training magazine surveys indicated greater use of minicomputers and mainframes. This may be because the proportion of very large companies was much higher in these surveys and larger companies are more likely to use the larger computer systems. Alternately, perhaps ASHROD respondents' organization made greater use of mini and mainframe computers than indicated but did not use them for CBIMT.

IBM and IBM combatable computers were the types of microcomputers most frequently used. This category of computers has long dominated in the government and business sectors. With 15% CBT use and 22% CBIVT use, the Macintosh held a respectable second place. The Macintosh users all used the Authorware Professional, an authoring system which is relatively easy to use and takes advantage of the

Macintosh graphical user interface and ability to easily transfer graphics from one program to another. With Authorware Professional now available on the Microsoft Windows graphical user interface on the IBM compatibles, the dominance of IBM and IBM combatable computers may strengthen.

Subproblem 5

For What Job Categories is CBIMT Used?

Those receiving the most CBT were professional staff, managers, supervisors, technical staff, and office/administrative support staff. Those receiving the least were production workers, customer service representatives, sales representatives and executives.

Professional staff, managers, and supervisors are high status groups, the members of which usually have a university education. That members of these groups received more computer-based training than did production workers or customer service representatives is consistent with the findings of Morrison & Rubenson (1989) in their review of Statistics Canada data about who gets trained. They noted that those with higher status occupations and higher education receive more training than those in lower status occupations having lower educational requirements.

Because status affects the amount of all types of training a person receives, it may affect access to CBIMT.

Another, perhaps stronger influence, is the types of skills that CBIMT is used to train. CBIMT, especially CBT, is perceived to be more effective at teaching computer skills, technical skills and unambiguous content. It is used most to teach computer skills. Soft skills and more ambiguous contents is thought to be better taught by other methods. Because Professional staff, managers, and supervisors work in offices, the computer skills training is relevant to them.

Technical staff may be considered a middle status group. Technical workers usually have post secondary education from community or technical colleges. They tend to receive a lot of training because of the pace of technological change. The training content tends to be unambiguous hard skills well suited to CBIMT delivery.

Of the groups receiving the most CBT, office/administrative support is the lowest status group. They receive more of this kind of training, despite their lower status, because computer use is heaviest in that job area and CBT is used most often to teach computer skills.

Those receiving the least CBT were executives, sales representatives, production workers and customer service representatives. Executives, a high status group, receive mostly soft skill training. This is a skill category that CBT tends not to be used for. Sales representatives, a mixed status group, also receives a preponderance of soft

skill training.

Production workers and customer service representatives are lower status groups that tend to receive less of all types of training. An alternate explanation for the lower percentage of organizations using CBT to train production workers is the preponderance of service organizations among those surveyed. Many of the respondents may have considered production workers to be a job category not in their organization.

While other job categories were not included among the choices, none were written in by the respondents. This suggests that CBT was not used to train cleaning staff, vehicle drivers, warehouse personnel or other lower status job categories.

CBT was used most to train those in the job categories that receive the most of all types of training and those in job categories where the content being trained is that which CBT is most often used to train.

The job categories most often trained using CBIVT were technical staff, managers and supervisors. Job categories trained somewhat less using CBIVT were office/administrative support and professional staff. Because of the inclusion of video, use of CBIVT for soft skill training is more accepted. This may account for a somewhat higher proportion of technical staff and supervisors and a somewhat lower percentage of office/administrative support staff receiving

CBIVT. Otherwise, the job categories trained using CBIVT followed the same pattern as those using CBT.

For What Types of Skills is CBIMT Used?

In the Training magazine survey reports skills taught are divided into three categories:

1. computer related skills
2. nontechnical skills (sales, management, interpersonal)
3. noncomputer related technical skills.

For comparison purposes, the results of the ASHROD survey have been similarly grouped in table V-4. Computer skills include:

- basic computer literacy
- Word processing
- data processing
- computer programming.

Grouped in the nontechnical skills category are:

- remedial basic education
- time management
- finance/accounting
- communication skills
- problem solving
- customer relations/services
- company orientation
- management skills.

Included in noncomputer related technical skills are:

- product knowledge
- equipment operation
- safety
- technical skills
- trade apprenticeship.

Table V-4

Skills Trained Using CBIMT

Type of Skill	ASHROD CBT %	ASHROD CBIVT %	1992 Training CBT %
Computer related	65	56	87
Non-technical	30	56	23
Non-computer technical	50	44	18

(Filipczak, 1992)

As table V-4 shows, in both the ASHROD and Training magazine surveys, computer related skills were found to be taught the most. This is consistent with the findings of the literature search. Four of the 11 organizations listed in Chapter 2 as being examples of Canadian use of CBIMT, used it to teach computer use skills. Hirschbuhl reported "...that data processing applications have had the largest early successes with CBT." (p. 60, 1989)

While use of CBIMT to teach computer related skills was prominent, half of the respondents using CBT used it to

teach noncomputer related technical skills and 30% used it to teach non-technical skills. Much smaller proportions of the CBT users answering the 1992 Training magazine survey used it to teach the noncomputer related categories of skills.

Among CBIVT users, four of the nine (44%), used it to teach noncomputer related technical skills and 55% used it to teach nontechnical skills especially communication skills. The greater use of CBIMT to teach nontechnical skills may be because video provides a more human presence to a CBIMT lesson.

ASHROD respondents, like participants in other studies, used CBIMT most to teach computer related skills. However, a higher percentage of these organizations used it to teach noncomputer skills than did respondents to the Training magazine surveys.

The Conference Board of Canada in its survey of training in Canadian firms discovered that the type of training provided by the most respondents was computer training. Perhaps at least part of the reason that CBIMT is used most to train computer skills is because computer training is the type of training done most irrespective of delivery mode.

Subproblem 6

What do Survey Respondents Perceive to be the Advantages of CBIMT?

Survey respondents perceived a wide variety of advantages to CBIMT. The top six ranked in descending order are:

1. time flexibility
2. individualized instruction
3. the employee can train at his or her own pace
4. greater training effectiveness
5. less costly than conventional training
6. increased accountability for training.

The perceived advantages for CBIVT were very similar, with the following ranking:

1. individualized instruction
2. the employee can train at his or her own pace
3. time flexibility
4. less costly than conventional training
5. greater training effectiveness
6. safety factors.

The Hirschbuhl survey revealed the four main reasons for use to be:

1. reduced training time
2. increased training effectiveness
3. ability to document and track learner performance
4. fear of loss of competitive edge.

The only reason highly ranked in both surveys was increased training effectiveness. Two of the reasons noted in the Hirschbuhl report, reduced training time and the ability to document and track learner performance were tied with employee satisfaction in the overall ranking of the ASHROD survey.

While most of the advantages identified by both surveys are related, ASHROD respondents rated the flexibility and individualization more highly while Hirschbuhl's respondents placed a higher value on efficiency and benefits to the organization.

Subproblem 7

What do Survey Respondents Perceive to be the Disadvantages of CBIMT?

The biggest disadvantages to CBT, as identified by users were:

1. cost both of courseware and equipment
2. the lack of suitable good quality courseware and the lack of experienced courseware designers
3. commitment to other training methods
4. unrealistic expectations of what CBIMT can do.

The two main disadvantages to CBIVT were perceived to be cost and the lack of suitable courseware.

Hirschbuhl reported two major factors hampering CBT :

1. poor quality courseware

2. Lack of enough trained, experienced CBT professionals.

In the case of both CBT and CBIVT, cost was considered the biggest disadvantage with courseware availability the second largest. In the Hirschbuhl report, cost was not mentioned as being a problem. This may be because that survey was of very large corporations. The ASHROD study was a survey of smaller organizations. Cost is less of a problem for larger organizations. The availability problem, however, is shared by both large and small organizations.

Summary of Results

About one quarter of the respondent organizations developed CBIMT. Most could be divided into two groups - smaller organizations that developed for external sale and larger organizations that developed for internal use. All but one of the organizations in both groups were Alberta based.

Almost half of the organizations (45.5%) used CBIMT. There was a direct relationship between size and likelihood of use. There was only a weak relationship between number of training days per employee and probability of use.

Most organizations developing for sale were in the business and educational services sectors. The financial, real estate, insurance and banking sector was most prominent among organizations developing for internal use.

Organizations in the goods producing (manufacturing and resource), the financial, real estate, insurance or banking and the transportation, utilities and communications sectors were most likely to use CBIMT.

While a large proportion of responding organizations used CBIMT, most only used it for a small fraction of their training. Only 10% of users employed it for more than 20% of their training.

Among developers, 83% were expected to maintain or increase the amount of development they were doing. Users were even more committed with 95% of the organizations using CBT expected to maintain or increase use. Nine percent of organizations not using CBIMT were expected implement it and 27% were expected to investigate it.

Authorware Professional, Quest and Macromind Director were the programs used most to author CBIMT. IBM or IBM combatable microcomputers were used most to deliver CBIMT.

CBT was used most to train professional staff, technical staff and office/administrative support. Technical staff, managers and supervisors were the job categories trained most using CBIVT. The skills taught most by CBT were computer skills, equipment operation and product knowledge. CBIVT was used most to teach communication and computer skills.

Time flexibility and individualization were considered to be the greatest advantages of CBIMT. The largest

disadvantages were considered to be cost, lack of suitable courseware and commitment to other training methods.

Comparison with Other Studies

Comparisons of results of the ASHROD survey with the results of other studies are tenuous due to variations in populations, survey instruments and the years the studies were conducted. Still, the ASHROD study results are consistent with trends and patterns identified in the other studies. Some of them are:

- Organizations in the financial and health sectors are likely to develop CBIMT (Hirschbuhl, 1989).
- The communications, banking, finance, insurance, and manufacturing industries tend to be heavy users of CBIMT while the retail trade and accommodation and food industries do not (Hirschbuhl, 1989 and Communications Canada & Industry, Science and Technology Canada, 1990).
- The larger an organization is, the more likely it is to use CBIMT (Filipczak, 1992).
- CBIMT is used most to train computer skills (Filipczak, 1992 and Hirschbuhl, 1989).
- Increased training effectiveness is one of the main reasons for using CBIMT (Hirschbuhl, 1989).
- Poor quality courseware and the lack of experienced courseware designers are major factors

inhibiting growth in use of CBIMT (Hirschbuhl, 1989).

Comparisons of ASHROD study results with data from other studies suggest some hypotheses and raises some questions.

As a one time study, the ASHROD survey cannot indicate trends. However, the levels of development and use shown by the results were higher than those revealed by other studies. This may indicate growth in the development and use of CBIMT is taking place among ASHROD organizations.

Employees with more education and higher status receive more training. Thus executive, management, professional and technical personnel receive more training than do clerical, trade and production workers (Larson & Blue, 1991). ASHROD results were consistent with this data except that office/administrative support staff received more CBIMT than executives.

The business sectors most likely to develop CBIMT for internal use and those most likely to use CBIMT were those identified in other studies as likely to be heavy users of CBIMT (Hirschbuhl, 1989). Is there a relationship between the types of organizations that engage in more development and use of CBIMT and the types of employees that receive training? That is, do financial and communications organizations develop and/or use CBIMT more because they have higher proportions of professional and technical

employees than do organizations in retail and wholesale trade?

All of the studies that included information about skills trained indicated that CBIMT was used most to train computer skills. In discussions of results it is usually concluded that it is in the area of computer training that CBIMT is most accepted. According the Conference Board of Canada study, computer training is the most commonly offered kind of training regardless of method of delivery (Larson & Blue, 1991). To what extent is the prominence of computer training as a use of CBIMT a reflection of the amount of computer training going on rather than of a belief that CBIMT is well suited to computer training.

Recommendations for Further Research

In order to identify trends in the development and use of CBIMT there needs to be periodic comparable studies. The annual Training magazine survey is valuable for this reason. Repetition of this study with ASHROD members, would identify local trends. If the study was conducted throughout Canada and periodically repeated, national trends could be identified.

The ASHROD study highlighted the existence and characteristics of small companies that develop CBIMT for sale to external organizations. Further study could find out if the characteristics of these organizations - small,

independent, and locally based is common to development companies throughout Canada.

Presently new multimedia technologies are emerging and interest in multimedia is high. It would be useful to track the adoption of the various CBIMT technologies.

The extent to which use of CBIMT for computer training is a reflection of the amount of computer training going on or of the belief that CBIMT is well suited to computer training, is a problem with implications for the understanding of peoples' attitudes to CBIMT. Perhaps this could be answered by comparing the amount of computer training done by organizations using CBIMT to the amount that they do using other delivery methods.

Suggestions for Improvements to the Questionnaire

The ASHROD survey was conducted in the winter of 1992. If the questionnaire is used again, the following changes are suggested. These changes arise from changes in CBIMT technology, from comments of respondents and from analysis of the data generated by the survey.

In 1992 the most common forms of CBIMT were CBT and CBIVT using analog video disks. Analog video disk is expensive because it requires a video disk player, overlay board and monitor that can display both digital and analog signals. The disks are also expensive to produce. The quality of the video, however, is excellent. Digital video technologies, however, are now available. Presently they

are also expensive and produce a poorer quality image than does analog video. However, they are expected to become less expensive and quality should increase. Digital video, thus, may overtake analog video as the most prominent mode of motion video display.

To find out the extent that these forms of multimedia technology are being adopted, section 5 should have a question asking respondents which technologies they use. They could also be asked to evaluate the technologies used. Non-users could be asked if they plan to investigate or implement any of the video technologies.

A problem frequently mentioned in surveys of training, is that in large organizations, expenditure and delivery decisions are often decentralized. In ASHROD study, the solution was to treat parts of organizations (e.g. government departments) as separate organizations. The questionnaire could be improved by building in this approach. Respondents could be asked which at level training expenditure and delivery decisions are made. They could be asked to answer the demographic questions for that level only.

Following are suggestions for modifications to existing survey questions

Question 1.2

Different organizations use different names for their parts. The word department was not appropriate for some

respondents. A more generic term should be found.

Questions 1.3 - 1.4

The reference to North America was confusing to two respondents whose organizations existed only in Alberta. Perhaps the geographic area should be removed from the question.

One respondent from a government department felt excluded by the reference to company and organization. Add the word government department if government departments are included in the survey.

Questions 1.5 - 1.7

Add organization and government department to company.

Questions 1.5

One respondent asked if expenditures included salary and travel costs. Perhaps that should be clarified in the question.

Questions 1.7

The time period should be specified (i.e. per year).

Question 3.2

Add graphic design, scripting, disk geography and project management to the choices.

Questions 4.1 - 4.2b and 5.1 - 5.2b

Very few respondents to the ASHROD survey used CBIMT for more than 20% of training. A more useful group of choices may be: 0-5%, 6-10%, 11-20%, 20-50% and 51-100%.

Questions 4.1c and 5.1c

CBIVT should be changed to CBT in question 4.1c. Home should be added to both question. Employees sometime take tutorials home with them.

Question 4.5 and 5.5

It may be useful to group the choices into computer, technical, soft skills, and other. Safety, trade apprenticeship and equipment repair are additions suggested by respondents.

Questions 4.8 and 5.8

In the Conference Board of Canada study it was discovered that some training budgets are based on classroom attendance figures and that this discourages investment in CBIMT. Perhaps a choice could be included to capture this impediment. Loss of personal contact should also be added to the choices.

Conclusion

In 1992 a substantial number of organizations with employees in ASHROD developed and used CBIMT. The amount of development and use varied with the size and type of organization. The number of training days per employee had a weaker relationship to amount of CBIMT developed or used.

Among developers there was a 'U' shaped distribution with small organizations developing for sale, medium sized organizations not developing and large organizations developing for internal use.

Use varied as functions of both business activity and size. Organizations in the goods producing (manufacturing and resource), financial, real estate, insurance or banking, and transportation, utilities and communications sectors used CBIMT the most. Those in the retail and wholesale trade, government, and education services sectors used it the least. Larger organizations were more likely to use CBIMT than were smaller ones.

Most developers and users expected to maintain or increase development and/or use of CBIMT. This suggests a high degree of satisfaction with CBIMT.

Quest and Authorware were the most common authoring systems used and IBM and IBM compatibles the most common platform. Computer, hard, and soft skills were taught using CBIMT with computer skills predominating.

Flexibility and individualization were the greatest advantages of CBIMT and cost and availability of courseware were the greatest disadvantages.

With some revisions, the questionnaire used in this study could be an effective instrument if used in a larger study.

REFERENCES

Buckler, G & Greiner, L. (1988). Bang for your classroom buck; Setting up user training and support. Computing Canada. 14(8), 32-33.

Burnett, K. (1988, September 1). CBT complements in-class study. Computing Canada, 14(18), 39.

Buszowski, (1991). Ottawa municipality opts for mix of methods. Computing Canada. 17(24), 40.Duchastel, (1989).

Chevreau, (1987). CDC retains focus on CAL. Canadian Datasystems. 19(5), 92-93.

Communications Canada & Industry, Science and Technology Canada. (1990). Technologies in services. Ottawa: Author.

deGrandpre (1989). Adjusting to win. Ottawa: Ministry of Supply and Services.

Duchastel, J. (1989, September 1). Tapping human attributes fundamental to training success. Computing Canada, 15(18), 27, 30.

Employee training in America. (1986, July). Training and Development Journal. 40(7), 34-37.

Employment and Immigration Canada. (1989). Success in the Works: A Profile of Canada's Emerging Workforce. Ottawa: Employment and Immigration Canada.

Epstein, L. (1973). A model of the supply of training in industry. Dept. of Manpower & Immigration: Ottawa.

Filipczak, B. (1992). Computers in training. Training. 29(10), p. 52-53.

Filipczak, B. (1991). Multimedia: Tilting at windmills? Training. 28(5), p. 73-74.

Firm's computer-Based Training pays off in fast results. (1984). Computerworld, 18(44), p. 36.

Fortune 500 Survey. (1988, January). Training and Development Journal, 42(1), 30-37.

Geber, B. (1989, October). Industry report. Training,

26(10), 49-63.

Geber, B. (1991, October). Computers in training. Training, 28(10), 51, 57.

Gordon, J. (1985, October). Computers in training. Training, 22(10), 54-66.

Gordon, J. (1986, October). Where the training goes. Training, 23(10), 49-63.

Gordon, J. (1988, October). Who is being trained to do what. Training, 25(10), 51-60.

Head, G. (1985). Training cost analysis. Washington, DC: Marlin Press.

Hirschbuhl, J. (1989). CBT survey for computer-based training directions. Interactive Learning International, 5, 55-70.

Kennedy, D (1987). The tricks to training trainers. Computing Canada. 13(18), 39, 45.

Knowles, M. (1980). The modern practice of adult education. Chicago: Association Press.

Kulik, J., Kulik, C. & Cohen, P. Effectiveness of computer-based college teaching: A meta-analysis of findings. Review of Educational Research, 50, 535-544.

Larson, P. & Blue, M. (1990). Training and development 1990: Expenditures and policies. : Conference Board of Canada.

Lee, C. (1987, October). Where the training dollars go. Training, 24(10), 51-65.

Morrison, I., & Robinson, K. (1989). Adult education in an information economy. Learning, 5(2), 4-9.

Parrott, W. (1985, July). Negative management attitudes no barrier to CBI. Training and Development Journal, 39(7), 8.

Premier's Council. (1990). People and skills in the global economy. Premier's Council report. Toronto: Province of Ontario.

Prychidny, F. (1988). Keyboarding courses on the mark. Computing Canada. 14(18), 45, 47.

Roth, Jackie. (1985). GM talks training in a computer classroom. Industrial Management. 9(2), 30-31.

Ralphs, L & Stephan, E. (1986, October). HRD in the Fortune 500. Training and Development Journal, 40(10), 69-76.

Serveau, P. (1988, September 1). CBT and IVI should work together. Computing Canada, 14(18), 40, 46.

Szabo, M. (1987). A cost-effective implementation of computer-based training within a large government training organization. Interactive Learning International, 4(1), 81-84.

Trainers and computers: After the courtship. (1984, October). Training, 21(10), 58-58.

Wayne-Edwards. (1991). Learning to win: Education, training and national prosperity. Canadian Vocational Journal, 27(1), 5-9.

APPENDIX A

SURVEY INSTRUMENT

A Survey of the Use of Computer-Based and/or Interactive Video Training Among Selected Organizations in Northern Alberta

SECTION 1: DEMOGRAPHIC INFORMATION ABOUT RESPONDING ORGANIZATION

Directions: **Everyone should complete this Section.** Read each question and place a check mark in the box opposite your response.

1.1 What is your Company's primary business activity? (check only one)

- ☐ Manufacturing
- ☐ Hospitality
- ☐ Retail/Wholesale Trade
- ☐ Resource (Gas, Oil, Timber, Coal)
- ☐ Financial, Real Estate, Insurance or Banking
- ☐ Business Services
- ☐ Government or Military
- ☐ Health Care/Medical
- ☐ Educational Services
- ☐ Transportation, Utilities, Communications

1.2 What is the major function of your branch or department? (check only one)

- ☐ Personnel
- ☐ Data Processing, Systems Srvcs
- ☐ General/Corporate Management
- ☐ Marketing/Sales
- ☐ Training, Human Res. Dev.
- ☐ Safety
- ☐ Industrial Relations
- ☐ Library
- ☐ AV Production
- ☐ Advertising, Sales, PR

1.3 The total number of employees in your company or organization in North America is (check only one)

- ☐ Over 1,000
- ☐ 100 -249
- ☐ 500 - 999
- ☐ 50 - 99
- ☐ 250 - 499
- ☐ Under 50

1.4 The number of different physical locations of your company or organization in North America is.... (check one)

- ☐ Over 40
- ☐ 31-40
- ☐ 21-30
- ☐ 11-20
- ☐ 2-10
- ☐ One

1.5 The annual dollar value of expenditures for your company training in Alberta is.... (check one)

- ☐ Over $150,000
- ☐ 100,000-149,999
- ☐ 75,000-99,999
- ☐ 50,000-74,999
- ☐ 25,000-49,000
- ☐ Under 25,000

1.6 The current number of full time equivalent training staff for your company in Alberta is.... (check one)

- ☐ Over 10
- ☐ 6-10
- ☐ 1-5
- ☐ None

1.7 The average number of days spent in training per employee for your company in Alberta is.... (check one)

- ☐ Over 10
- ☐ 10-8
- ☐ 4-7
- ☐ Under 4

SECTION 2: USE OF INTERACTIVE TRAINING TECHNOLOGIES

Directions: **Everyone should complete Section 2.** Your responses to questions 2.1 and 2.2 will determine which of the remaining Sections you should skip and which you should complete.

To answer the questions in the remainder of this Survey, use the following definitions.

COMPUTER-BASED TRAINING (CBT) refers to the use of computers to deliver training, i.e., to instruct, or tutor, employees on any job-related skills of value to the employer and/or employee. If other forms of instruction, such as print, linear video, etc. are also used with the tutorials, these forms of instruction play a minor role.

COMPUTER-BASED INTERACTIVE VIDEO TRAINING (CBIVT) refers to the use of a combination of video and external computer to deliver training, i.e., instruct, or tutor, employees on any job-related skills of value to the employer and/or employee. The predominant delivery mode of training is through integrated CBT and Video.

DEVELOPERS OF TRAINING

2.1 My company or organization DEVELOPS, entirely or in part, the following training products for internal use or for sale to outside organizations.... (check one)

1 ☐ CBT but not CBIVT
2 ☐ CBIVT but not CBT
3 ☐ both CBT and CBIVT
4 ☐ Neither CBT nor CBIVT

CONSUMERS OF TRAINING

2.2 The training program of my company or organization USES the following to deliver training to its employees.... (check one)

1 ☐ CBT but not CBIVT
2 ☐ CBIVT but not CBT
3 ☐ both CBT and CBIVT
4 ☐ Neither CBT nor CBIVT

DIRECTIONS FOR COMPLETING THE REST OF THE SURVEY:

If you answered 1, 2 OR 3 to question 2.1, please COMPLETE SECTION 3 (page 3)
If you answered 4 to question 2.1, please SKIP SECTION 3

AND

If you answered 1 to question 2.2, please complete SECTION 4 (pages 5-7)
If you answered 2 to question 2.2, please complete SECTION 5 (pages 8-11)
If you answered 3 to question 2.2, please complete SECTIONS 4 AND 5 (pages 5-11)
If you answered 4 to question 2.2, please complete SECTION 6 (page 12)

Would you like to receive a copy of the summary report from this survey? Check the appropriate box below.

☐ Yes, please send me a copy ☐ No, do not send me a copy

SECTION 3: DEVELOPMENT OF CBT/CBIVT PRODUCTS

Complete this section if your company or organization **develops** CBT, CBIVT, or both.

3.1 (a) What is the nature of your company or organization's CBT/CBIVT development? (Check all that apply)

- ☐ Internally developed, for internal use
- ☐ Internally developed, for sale to external organizations
- ☐ Developed through a joint effort with an outside development firm for internal use
- ☐ Developed for revenue through a joint effort with the end user

3.1 (b) If you develop the CBT/CBIVT product for rent or sale to external organizations, is it: (Check all that apply)

- ☐ Designed for general sale
- ☐ Designed for a specific client

3.2 What expertise does your company or organization contribute to the CBT/CBIVT development?. (check all that apply)

- ☐ Content expertise
- ☐ Programming
- ☐ Problem analysis
- ☐ Other (Please specify below)
- ☐ Instructional Design
- ☐ Video Production
- ☐ Evaluation/validation of courseware
- ☐ Project Management

_____

_____

_____

3.3 What authoring software is used in producing the CBT/CBIVT? (check all that apply)

- ☐ Authorware Professional
- ☐ Phoenix
- ☐ Tencore
- ☐ Other (Please specify below)
- ☐ Ask•Me 2000/Professional
- ☐ Quest
- ☐ Toolbook

_____

_____

3.4 Please indicate which of the following represents your company or organization's expected development of CBT/CBIVT in the coming fiscal year. (Check only one)

- ☐ Stop developing CBT/CBIVT altogether
- ☐ Decrease development of CBT/CBIVT
- ☐ Stay at the current level of CBT/CBIVT development
- ☐ Moderate increase in the development of CBT/CBIVT
- ☐ Major increase in the development of CBT/CBIVT

3.5 What CBT/CBIVT product developed by your company are you particularly proud of and why?

SECTION 4: USE OF COMPUTER BASED TRAINING

Complete this Section if your company or organization **uses** CBT for internal training.

4.1 Please indicate the percentage of total training delivered by Computer Based Training in your company or organization.

☐ 0-20 % ☐ 21-40 % ☐ 41-60 % ☐ 61-80 % ☐ 81-100 %

4.2 (a) Please indicate the percentage of time Computer Based Training is used in your company or organization to provide individual training.

☐ 0-20 % ☐ 21-40 % ☐ 41-60 % ☐ 61-80 % ☐ 81-100 %

4.2 (b) Please indicate the percentage of time Computer Based Training is used in your company or organization to provide group or classroom instruction.

☐ 0-20 % ☐ 21-40 % ☐ 41-60 % ☐ 61-80 % ☐ 81-100 %

4.2 (c) Please indicate the location where your CBIVT training is delivered.

☐ In a separate training facility
☐ On the job site
☐ A combination of the above

4.3. Indicate the type of CBT delivered in your organization's training program (check all that apply)

☐ Review and practice
☐ Tutorial
☐ Simulation
☐ Diagnostic and prescriptive assessment of skills or competencies
☐ Electronic connections to live instructors/coaches

4.4 Please indicate the types of job categories who receive training via CBT (check all that apply)

☐ Executives
☐ Professional staff
☐ Sales Representatives
☐ Technical staff
☐ Office/Administrative support
☐ Managers
☐ Supervisors
☐ Production workers
☐ Customer service representatives
☐ Other (Please specify)_____

_____

_____

_____

4.5 Please check the categories of training for which your company or organization uses Computer Based Training (check all that apply)

- ☐ Remedial basic education
- ☐ Basic computer literacy
- ☐ Word processing
- ☐ Data processing
- ☐ Computer programming
- ☐ Equipment operation
- ☐ Product knowledge
- ☐ Time management
- ☐ Project management
- ☐ Leadership skills
- ☐ Finance/Accounting
- ☐ Stress management
- ☐ Problem-solving
- ☐ Communication skills
- ☐ Sales skills
- ☐ Customer relations/services
- ☐ Company orientation
- ☐ Other (Please specify below)

_____
_____
_____

4.6(a) Please indicate the type of delivery system, used by your organization, to provide Computer Based Training.

- ☐ Microcomputer (personal computer and/or Local Area Network)
- ☐ Minicomputer (e.g., VAX, IBM AS400)
- ☐ Mainframe (Please Specify city where mainframe is located)

4.6(b) Please indicate the type of microcomputer system, used by your organization, to provide CBT.

- ☐ IBM or IBM clone (DOS)
- ☐ Macintosh
- ☐ Other (please specify)

_____
_____

4.7 Several positive characteristics of CBT identified in the literature are listed below. Please RANK any of these characteristics that your company or organization have found to be advantageous to its training program. (1= greatest advantage, 2 = next greatest advantage, etc.)

_____ Individualized instruction
_____ Employee can train at own pace
_____ Greater employee satisfaction with training method
_____ Time flexibility
_____ Less costly than conventional training
_____ Greater training effectiveness
_____ Reduced training time
_____ Ability to document and track learner performance
_____ Increased accountability for training
_____ Other (Please specify)_____

_____
_____
_____
_____

4.8 Several disadvantages of CBT have been identified in the literature and are listed below. Please rank any of these characteristics that your company or organization has found to be disadvantageous to its training program. (1= greatest disadvantage, 2 = next greatest disadvantage, etc.)

_____ Cost of equipment
_____ Cost of purchasing courseware
_____ Cost of developing courseware
_____ Lack of experienced courseware designers
_____ Lack of suitable courseware
_____ Lack of suitable equipment for delivering training
_____ Lack of support/maintenance resource people
_____ Reluctance to change (technophobia)
_____ Poor quality of hardware
_____ Poor quality of courseware
_____ Commitment to other training methods
_____ Unrealistic expectations
_____ Other (Please Specify)_____
_____
_____

4.9 Please indicate which of the following represents your company or organization's expected use of CBT in the coming fiscal year. (Check only one)

☐ Stop using CBT altogether
☐ Decrease use of CBT
☐ Stay at the same level of CBT use
☐ Moderate increase use of CBT
☐ Major increase in the use of CBT

4.10 If your CBT product is developed by an outside source, is it:. (Check only one)

☐ Purchased off-the-shelf
☐ Purchased off-the-shelf but modified to your specifications
☐ Custom designed
☐ Does not apply

4.11 What CBT product used by your company would you recommend and why?.

_____
_____
_____
_____
_____

SECTION 5: USE OF COMPUTER BASED INTERACTIVE VIDEO TRAINING

Complete this Section if your company or organization **uses** Computer Based Interactive Video Training.

5.1 (a) Please indicate the percentage of total training delivered by Computer Based Interactive Video TAPE Training in your company or organization.

☐ 0-20 % ☐ 21-40 % ☐ 41-60 % ☐ 61-80 % ☐ 81-100 %

5.1 (b) Please indicate the percentage of total training delivered by Computer Based Interactive Video DISK Training in your company or organization.

☐ 0-20 % ☐ 21-40 % ☐ 41-60 % ☐ 61-80 % ☐ 81-100 %

5.2 (a) Please indicate the percentage of time Computer Based Interactive Video Training is used in your company or organization to provide individual training.

☐ 0-20 % ☐ 21-40 % ☐ 41-60 % ☐ 61-80 % ☐ 81-100 %

5.2 (b) Please indicate the percentage of time Computer Based Interactive Video Training is used in your company or organization to provide group or classroom instruction.

☐ 0-20 % ☐ 21-40 % ☐ 41-60 % ☐ 61-80 % ☐ 81-100 %

5.2 (c) Please indicate the location where your CBIVT training is delivered.

☐ In a separate training facility
☐ On the learners' job site
☐ A combination of the above

5.3. Indicate the type of CBIVT delivered in your organization's training program (check all that apply)

☐ Review and practice
☐ Tutorial
☐ Simulation
☐ Diagnostic and prescriptive assessment of skills or competencies
☐ Electronic connections to live instructors/coaches

5.4 Please indicate the types of job categories which receive training via Computer Based Interactive Video Training (check all that apply)

- ☐ Executives
- ☐ Professional staff
- ☐ Sales Representatives
- ☐ Technical staff
- ☐ Office/Administrative support
- ☐ Managers
- ☐ Supervisors
- ☐ Production workers
- ☐ Customer service representatives
- ☐ Other (Please specify)_____

_____

_____

_____

5.5 Check the categories of training for which your company or organization uses computer based interactive video training (check all that apply)

- ☐ Remedial basic education
- ☐ Basic computer literacy
- ☐ Computer applications
- ☐ Problem-solving
- ☐ Communication skills
- ☐ Equipment maintenance
- ☐ Product knowledge
- ☐ Time management
- ☐ Project management
- ☐ Leadership skills
- ☐ Finance/Accounting
- ☐ Stress management
- ☐ Computer programming
- ☐ Equipment operation
- ☐ Sales skills
- ☐ Customer relations/services
- ☐ Company orientation
- ☐ Other (Please specify below)

_____

_____

_____

_____

_____

_____

5.6(a) Please indicate the type of delivery system, used by your organization, to provide Computer Based Interactive Video Training.

- ☐ Microcomputer (personal computer and/or Local Area Network)
- ☐ Minicomputer (e.g., VAX, IBM AS400)
- ☐ Mainframe (Please Specify city where mainframe is located)

_____

5.6(b) Please indicate the type of microcomputer system, used by your organization, to provide Computer Based Interactive Video Training.

- ☐ IBM or IBM clone (DOS)
- ☐ Macintosh
- ☐ Other (please specify)

_____

_____

_____

5.7 Several positive characteristics of computer based interactive video training identified in the literature are listed below. Please RANK all of these characteristics that your company or organization have found to be advantageous to its training program. (1= greatest advantage, 2 = next greatest advantage, etc.)

_____ Individualized instruction
_____ Employee can train at own pace
_____ Greater employee satisfaction with training method
_____ Time flexibility
_____ Less costly than conventional training
_____ Greater training effectiveness
_____ Reduced training time
_____ Ability to document and track learner performance
_____ Increased accountability for training
_____ Safety factors (e.g., radiation protection)
_____ Other (Please specify)_____

_____
_____
_____
_____

5.8 Several disadvantages of computer based interactive video training have been identified in the literature and are listed below. Please RANK any of these characteristics that your company or organization have found to be disadvantageous to its training program. (1= greatest disadvantage, 2 = next greatest disadvantage, etc.)

_____ Cost of equipment
_____ Cost of purchasing courseware
_____ Cost of developing courseware
_____ Lack of experienced courseware designers
_____ Lack of suitable courseware
_____ Lack of suitable equipment for delivering training
_____ Lack of support/maintenance resource people
_____ Reluctance to change (technophobia)
_____ Poor quality of hardware
_____ Poor quality of courseware
_____ Commitment to other training methods
_____ Unrealistic expectations
_____ Other (Please Specify)_____

_____
_____

5.9 Please indicate which of the following represents your company or organization's expected use of computer based interactive video training in the coming fiscal year. (Check only one)

☐ Stop using CBIVT altogether
☐ Decrease use of CBIVT
☐ Stay at the same level of CBIVT use
☐ Moderate increase use of CBIVT
☐ Major increase in the use of CBIVT

5.10 If your CBIVT product is developed by an outside source, is it. (Check only one)

- ☐ Purchased off-the-shelf
- ☐ Purchased off-the-shelf but modified to your specifications
- ☐ Custom designed
- ☐ Does not apply

5.11 What CBIVT product used by your company would you recommend and why?

_____
_____
_____
_____
_____

SECTION 6: NON-USERS OF INTERACTIVE TRAINING TECHNOLOGIES

DIRECTIONS: Complete this Section if your company or organization **uses neither** CBT **nor** CBIVT for training.

6.1 What are the reasons that your company or organization has not adopted CBT or CBIVT? (Check all that apply)

- ☐ Cost of equipment
- ☐ Cost of purchasing courseware
- ☐ Cost of developing courseware
- ☐ Cost of producing video images
- ☐ Difficulty in making changes to video disk
- ☐ Lack of experienced courseware designers
- ☐ Lack of suitable courseware
- ☐ Poor quality of courseware
- ☐ Unaware of CBT or CBIVT
- ☐ Lack of corporate support for CBT or CBIVT
- ☐ Commitment to other training methods
- ☐ Unrealistic expectations
- ☐ Other (Please Specify)_____

_____

_____

6.2 Does your company or organization have any plans to implement CBT or CBIVT?

☐ YES ☐ NO ☐ DON'T KNOW

6.3 Does your company or organization have any plans to investigate CBT or CBIVT?

☐ YES ☐ NO ☐ DON'T KNOW

Thank you for your assistance in completing this survey. Please send the completed form to:

APPENDIX B

RESPONDENT ORGANIZATIONS

RESPONDENT ORGANIZATIONS

AADAC

Access Network

Alberta Blue Cross

Alberta Environment

Alberta Government Telephones

Alberta Health Care

A.L.C.B.

Alberta Power Ltd.

Alberta Transportation & Utilities

Alberta Treasury Branches

Beaver Lumber Company Ltd.

The Brick

Charles Camsell Provincial Hospital

Christie Communications

City of Edmonton Computing Resources

City of Edmonton

City of Edmonton Environmental Services

City of Edmonton Transit Division

Darryl Thomas Consulting Associates

Edmonton Ambulance Authority

Edmonton Parks & Recreation

Edmonton Power

Edmonton Public Library

Edmonton Telephones

E.E. Brownfield, Management Consultants

Equus Consulting Group

Esso Petroleum Canada

GE Capital

Grant MacEwan Community College Business Outreach

Innovision Video Inc.

Jaine A. Buse & Associates Inc.

Mainstream Access Corp.

Northwestern Utilities

Nova
Human Resources
Employee & Organizational Effectiveness

Nova
Technical Training Department

Parkland Continuing Education

Royal Lepage Real Estate Services Ltd.

Staff Bureau

Strathcona County

University of Alberta
Extension

University of Alberta
Personnel Services

Welwood Canada

Worker's Compensation Board

Vicom